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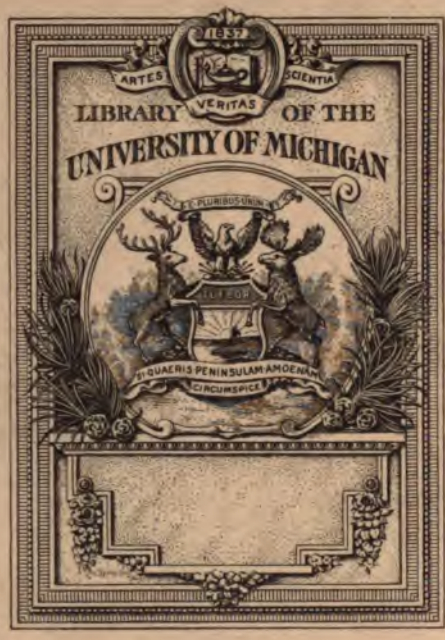
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RETROSPECT

OF

PRACTICAL MEDICINE AND SURGERY,

BEING

A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M.D.,

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.,

AND

JAMES BRAITHWAITE, M.D., LOND.,

ASSISTANT-SURGEON TO THE LEEDS HOSPITAL FOR WOMEN AND CHILDREN.

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PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

ART. 1.—THE ETIOLOGY OF TYPHOID FEVER.

By the EDITOR OF THE MEDICAL PRESS AND CIRCULAR.

Notwithstanding the many excellent monographs we possess upon the subject of typhoid fever, it must be said that much remains to be done before the medical world shall become unanimous upon all points in the history of that very important disease. A discussion has recently taken place in the Société de Médecine Pratique of Paris which throws some light on the etiology, a point always very obscure. Dr. Flamarion mentioned that he had observed seventy-eight cases of this affection at the end of 1873 and the commencement of 1874 in two villages in Haute-Marne, twenty-seven of them being in Louvières and fifty-one in Donnemarie. Only two of these patients died, one of them during the disease, and the other in the period of convalescence, in consequence of imprudence.

The author, without going into any generalities about the etiology of typhoid fever, limited himself to seek out what was the origin of the two epidemics he had witnessed. He insisted particularly upon the evil influence which the water seemed to maintain, considered either as causing exhalations, or as an article of consumption. It seems that at Louvières twenty-one patients out of twenty-seven lodged in houses the doors and windows of which looked out upon a watercourse, which was pretty clear, but along which, for some years past, each house had established a sort of washing establishment, which became the receptacle of the kitchen refuse, and sometimes of filth.

Dr. Flamarion, with Pettenkofer, makes the level of the underground water play an important part in the production of typhoid fever. The lowering of this level, after a long drought, must, he thinks, contribute to provoke a putrid fermentation in the bed of such underground streams. For some years past the inhabitants of Louvières, it seems, had given up getting their supplies of water from springs which arose above the ravine, and had drawn them from a new spring in the middle of a little hill. Now, it was impossible not to be struck with the very regular succession, after the dryness, of the appearance of new cases of typhoid fever in July and September, 1873, in this village.

At Donnemarie there was no watercourse, except a little river, which ran at the foot of a hill, at the top of which the village was situated. When rain falls, the streets are furrowed in all directions by currents of water which may sometimes change into little torrents. These unite in a double stream, which merges into one in the middle of the hill, where the public fountain is situated. These streams, thus contaminated, become infiltrated by the waters which wash the dunghills and carry with them the straw, so that, when it rains, there issues from the pipe of the public fountain a dirty, muddy water, which *the cattle sometimes refuse* to drink. A remarkable fact is that the

epidemic in this village commenced at the beginning of December, after abundant rains, and that the recrudescence of the disease has always coincided with an elevation of the layer of water in the pluviometer. The chemical analysis of the fountain water, in December, showed a great quantity of organic matter in it.

With regard to the treatment of typhoid fever, the author mentions some of the so-called special treatments of the disease; and he more particularly insists on the treatment of Brand, which he could not try in the country on account of the prejudice of the country people. He does not see that this method, which at first promised so much success, now gives results more favourable than those obtained by Valleix, Bouillaud, Andral, and Louis. The best statistics vary from 6·6 to 9·7 per cent.

Dr. Flamarion, for his part, said that he had employed a treatment apparently very complicated, but which was based on the general principle of watching indications, which he divided into general indications, directed to the whole of the symptoms and to the form of the disease, and special, which were directed to each separate symptom. Thanks to this treatment, the author had lost only 1.33 per cent. of his patients, for he eliminated the cases of death due to imprudence at a time during convalescence, when cure might be considered as certain.

Dr. Flamarion then passes in review the different methods of treatment which have been suggested to him by the general indications, in the forms of ambulatory, mucous, and ataxodynamic fever. He then refers to the methods of treatment suggested by the special symptoms of each case, such as headache, delirium, pain in the spine, fever and heat, fuliginosities, diarrhœa, vomiting, constipation, meteorism, piles, bronchitis, hypostatic congestion, pneumonia, and gangrene.

It will be seen by this *résumé* of Dr. Flamarion's paper, that in France, as in this country, it is now beginning to be almost universally admitted that the prominent cause of typhoid fever is the impurity of drinking-water. Instances have of late years been so multiplied of the evil effects of the communication of sewage with drinking-water that there are probably but few physicians who now refuse to admit that this is the chief cause of the occurrence of epidemics of typhoid fever. Dr. Flamarion says but little about the contagious nature of the disease.

With respect to the treatment of Brand by cold water affusions, one very great difficulty in carrying this out has been mentioned; and that consists in the great prejudices against such a treatment, which exist even in London and in the best conducted hospitals in this country. It is doubtful, on this account, whether the cold-bath treatment of typhoid fever has ever been fairly tried in this country as yet. Whether Dr. Flamarion's wonderfully excellent statistics could be verified in London is a matter of grave doubt, and we suspect that, under all treatments, the mortality from typhoid fever will occasionally prove very high in such large cities. But there seems to be some prospect of almost entirely getting rid of typhoid fever from our better-drained towns. Meanwhile, the last word has by no means been spoken about typhoid fever and its etiology and treatment.—*Medical Press and Circular, April* 14, 1875, *p.* 322.

2.—CONTAGIA AND BACTERIA.

Reported by Dr. CHARLES A. CAMERON, Prof. of Chemistry and Hygiene in the R. C. Surgeons Ireland.

On the 6th April, 1875, Dr. H. Charlton Bastian, Professor Anatomy, University College, London, delivered before the ciety of London an address on the Germ Theory of Disease a well-known and an able advocate of the doctrine of sp tion. Though he has not been able as yet to adduce any [illegible] of living organisms from mineral matter, he believes

clusively demonstrated the fact that certain low forms of life are generated during the decay of organic matter, and that they are not necessarily produced from living beings of a similar kind. With reference to bacteria—which so many pathologists now consider as closely related to the disease poisons, if some of them be not actually the virus of zymotics—Dr. Bastian argues that they are merely "pathological products." He admits that they are found abundantly in pus, in the tissues of persons suffering from certain contagious diseases, but he contends that they are also widely distributed throughout the human body in connexion with dying tissue, and that their existence therein is most easily explicable by the assumption of an origin by heterogenesis and by archebiosis. When, however, bacteria do come into existence spontaneously as a product of the decomposition of nitrogenous tissues, then, according to Bastian, they multiply rapidly according to "the ordinary fashion." The greater part of Dr. Bastian's address is devoted to an attempt to refute the views of Pasteur, Burdon-Sanderson, Beale Lister, and other upholders of the germ theory of disease; and he sums up his arguments by enumerating the following "facts," as he terms them:—

"1. With two exceptions, no definite germs or organisms are to be met with in the blood of patients suffering from these diseases during any stage of their progress.

"2. The virus or contagium of some of these diseases, whatever it may be, does not exhibit the properties of living matter.

"3. On the other hand, the virus of most of these contagious diseases with which definite experiment has been made is most potent in the fresh state, whilst its power very distinctly diminishes in intensity as organisms reveal their presence more abundantly therein—facts which would seem to point to the conclusion, or at least are quite consistent with the notion, that the contagious poison may be a chemical compound which gradually becomes destroyed or modified by the successive changes taking place in association with processes of putrefaction.

"4. There is the extreme improbability of the supposition that this whole class of diseases should be caused by organisms known only by their effects.

"5. The facts of the sudden cessation, periodical visitation, and many of the other phenomena of epidemics, however difficult they may be to explain upon any hypothesis, seem to oppose almost insuperable obstacles to the belief that living organisms are the causes of such epidemics of specific contagious diseases."

Dr. Bastian labours hard to demolish the germ theory of disease; but why does he not furnish a more plausible, or even as probable a hypothesis to account for the propagation of contagious maladies? He should recollect the oft-quoted words of Horace:—

"Si quid novisti rectius istis
Candidus imperti; si non his utere mecum."

Is there any "fact" better established than that a healthy person may contract small-pox or typhus from an infected person without actual contact of bodies? Does not the history of Asiatic cholera prove to a demonstration that the disease is or [illegible] highways of man? Would the recent outbreak [illegible] occurred if their island-homes had [illegible] possible to answer any of these [illegible] tives. That a [illegible] produces a [illegible] itted,

epidemic in this village commenced at the beginning of December, after abundant rains, and that the recrudescence of the disease has always coincided with an elevation of the layer of water in the pluviometer. The chemical analysis of the fountain water, in December, showed a great quantity of organic matter in it.

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Dr. Bastian labours hard to demolish the germ theory of disease; but why does he not furnish a more plausible, or even as probable a hypothesis to account for the propagation of contagious maladies? He should recollect the oft-quoted words of Horace:—

"Si quid novisti rectius istis
Candidus imperti; si non his utere mecum."

Is there any "fact" better established than that a healthy person may contract small-pox or typhus from an infected person without actual contact of bodies? Does not the history of Asiatic cholera prove to a demonstration that the disease is only propagated along the highways of man? Would the recent outbreak of measles amongst the Fijians have occurred if their island-homes had remained unvisited by Europeans? It is impossible to answer any of these questions except by the most emphatic affirmatives. That a *something* passes from sick to healthy men and other animals and produces a specific disease is now an incontrovertible fact. Surely if such be admitted, the existence of a contagium of some kind must also be acknowledged. The contagium can hardly be a gas, or be produced by "abnormal conditions of the atmosphere;" for, if that were the case, how could we explain the propagation of vaccinia or of syphilis? We have read most carefully through Dr. Bastian's address; but it has failed to shake our belief in the germ-theory of disease. We admit with him that bacteria swarm in decaying animal and vegetable matter, when no disease is present. We also grant that, whilst bacteria occur in great numbers in the blood of certain of the lower animals *in a normal state, they are absent* from the blood of men when in health. *This proves nothing. Every microscopist* knows that bacteria are to be found

almost everywhere. Beef-tea, a few hours old, swarms with them. Almost everything we eat contains them. Bacteria of the ordinary kind are, no doubt, harmless enough ; but there may be forms of life resembling, only in their structures, the bacteridæ, but which may differ as widely from others in their effects upon man as the poisonous fungus does from the edible mushroom with which it is often confounded. There are diseases which every one admits are produced by living organisms, animal and vegetable. Most of the diseases of our agricultural plants are produced by minute vegetables, which multiply with great rapidity. The itch in man, and the scab in the lower animals, are undoubtedly contagious diseases, as they are produced by the introduction of living beings and their multiplication within the body. If the itch acarus were so minute that the microscope could not discover its existence, we should have Dr. Bastian denying that it was caused by a "living organism capable of reproducing its kind." Dr. Bastian gives no satisfactory explanation of the remarkable facts proved by Chaveau, and subsequently by Burdon-Sanderson—namely, the existence in the infecting matter of vaccine and of sheep-pox of organised and moving particles, upon which the infecting properties of the matter depend. He says that the fact that dried vaccine retains its vitality is against the assumption of the existence of disease germ in it. But why should it be so ? Desiccated seeds retain their vitality. The grains of wheat found in the pyramids, in the hands and tombs of Egyptian dead, though 3000 years old, have developed healthy plants—the "mummy wheat."

In the discussion which followed the reading of Dr. Bastian's papers, Dr. Dougall, of Glasgow, supported the author's views, as did also, to some extent, Dr. Crisp. On the other hand, Dr. Bastian's views were combated very ably by Dr. Maclagan. The latter stated that it was not necessary to disbelieve the possibility of the spontaneous development of bacteria in order to hold consistently the germ-theory of disease. He agreed with Dr. Burdon-Sanderson that all microzymes are not contagia, but that all contagia may be microzymes. He admitted that Dr. Bastian has experimentally proved that bacteria were pathological products ; but he contended that the establishment of that fact in no wise invalidated the germ-theory of disease.

Dr. Dougall, who agreed with Dr. Bastian, pointed out that the results of his experiments proved that putrefaction took place in liquids without the simultaneous appearance of bacteria, whilst bacteria were to be found in liquids which were not fermenting. The two phenomena are distinct and not necessarily even correlated. We do not, however, think that the illustration of a case in which putrefaction is present without the occurrence of bacteria, adduced by Dr. Dougall, is very striking. He stated that a mixture of blood and one-eighth of its weight of solution of potash, evolves at once a putrid odour, which it retains for a fortnight. At the expiration of two or three months no albumen is to be found in the liquid, in which bacteria are never found. We would venture to suggest that such a mixture would not putrefy in the ordinary sense of the word, but would be chemically acted upon by the powerful corrosive agent, potash, and decomposed. We are, however, aware that Dr. Dougall has observed putrefaction in liquids which were not undergoing decomposition from external chemical agencies, and which did not contain bacteria. But all this has really no direct bearing upon the germ-theory.

Mr. Jonathan Hutchinson agreed with Dr. Maclagan in attributing the causes of specific fevers to the introduction of specific germs into the system, but he did not agree with him in thinking that the contagiousness of certain forms of inflammation could be accounted for by the germ theory. In the case of syphilis and of erysipelas, he considered that the products of inflammation might themselves be the means of "contagion by contiguity and the patient's own tissues; contagion through the patient's vascular channels, it may be to somewhat distant parts; or a contagion, if the conditions favour *such a trans*plantation of them, to another individual." On reviewing the *whole paper, and the* discussion which followed it, we cannot avoid coming *to the conclusion that* the supporters of the germ-theory had the best of the *argument. So far as facts* go, no very new ones were adduced, and, indeed,

are scarcer than theories in relation to our knowledge of the causes of zymotic maladies and contagious inflammations. But it seems, from every point of view, more rational to assume that contagious affections of all kinds are produced, each of them by a specific germ, than to take for granted that they arise from the introduction of ordinary particles of dead matter into the system. Dr. Maclagan was happy in his suggestion that the increase of bacteria in a fluid in proportion to the diminution of the intensity of its septic virus, which was adduced by Dr. Bastian as an argument against the germ-theory, is probably due to the bacteria increasing at the expense of the contagium itself, which he held to be a living entity, "minute beyond the reach of all sense."—*Dublin Journal of Medical Science, August*, 1875, *p.* 145.

3.—ON THE PREVENTION AND TREATMENT OF SCARLATINA AND OTHER INFECTIOUS DISEASES BY THE INTERNAL ADMINISTRATION OF DISINFECTANTS.

By Dr. David J. Brakenridge, Assistant-Physician to the Royal Infirmary, late Physician to the Royal Hospital for Sick Children, Edinburgh.

The whole phenomena in infectious diseases are best embraced and explained by the germ theory. Whether the minute particles of living matter which constitute disease-germs consist of animal or of vegetable bioplasm, is a question which remains to be solved. Probably the latter view is the correct one. There certainly does appear to exist a close analogy between the behaviour of such disease-poisons on the one hand and ferments on the other.

On this hypothesis we can readily understand how certain chemical agents, which have been found to destroy the life or inhibit the activity and multiplication of those organisms which are invariably associated with fermentation and putrefaction, and coincidently, if not consequently, to arrest these processes themselves, should have been successfully employed to prevent the spread of infectious diseases.

It has, thus, long been the practice to subject to the influence of such agents as permanganate of potash, chloride of lime, sulphurous acid, carbolic acid, &c., all liquid and solid substances supposed to be impregnated with the poison of an infectious disease. And striking results have been obtained by mixing the air itself—the medium through which the minute germs might be wafted into the body—with disinfectant gases.

A very universal accord has long been, and still is, given to the belief that by such means infectious diseases can be more or less disarmed of their virulence, limited in their spread, or even altogether prevented.

When fever breaks out in a house, a sense of comparative security accompanies the free and judicious use of disinfectants. Even the prudent physician is careful, in such a case, before leaving the sick-room, to wash his hands with Condy's fluid or carbolised soap.

Supposing, however, that our means of disinfection, external to the body, were perfect, it would still be impossible to keep an individual, in all his surroundings, perpetually thus protected. We are constantly called upon, not merely to prevent the spread of disease, but to cure actual attacks which threaten life. Attention has, therefore, been much directed of late to the following question. When a case of infectious disease has actually occurred, can any disinfecting influence be brought to bear upon the disease-germs within the body? Is it possible, in short, to disinfect the living tissues? Admitting the analogy between disease-action and putrefaction or fermentation, it must be allowed that, if we can so disinfect the tissues of a living animal, that when it is put to death they will resist putrefaction, there is no reason why we should not hope to be able by suitable means to arrest or prevent zymotic disease.

Professor *Polli, of Milan, administered* to animals, without any ill effects, *large doses of the sulphites of the* alkalies and alkaline earths. These ani-

mals were killed, and it was then found that, whilst an animal killed under ordinary circumstances rapidly putrefied, those animals to which the sulphites had been administered showed no signs of putrefaction.

Dr. Sansom fed two guinea-pigs "with pills composed of arrowroot mixed with sodium sulpho-carbolate. No other food was given. In four days the little animals had consumed 275 grains of the salt. No obvious effect was produced, except a slight looseness of the evacuations." The animals were then killed, and it was found that "the flesh showed a marked tendency to resist putrefaction."

In the Royal Hospital for Sick Children, and more recently in the scarlet fever wards of the Royal Infirmary, I have for some years had considerable opportunities of studying scarlet fever. It has been my practice to leave the disease to follow its natural course, and to content myself with the treatment of symptoms or complications when these called for interference. Last autumn, however, a succession of very severe and rapidly fatal cases occurred within a short period. I then determined to test fairly the value of the internal administration of disinfectants; for this appeared to me to be the only method of treatment which had any theoretical value to recommend it. Of the various substances employed for this purpose, the sulpho-carbolate of sodium, originally proposed by Mr. Crookes, and afterwards more widely introduced by Dr. A. E. Sansom, seemed to be the most suitable. The advantages of this salt may be gathered from the following account of its action, which is given by Dr. Sansom in his valuable work on "The Antiseptic System":—

"It was found that twenty-grain doses of sodium sulpho-carbolate could be readily administered to adults. So free from taste was the solution, that many said it seemed only like water itself. The dose was increased in several cases to sixty grains, administered every four hours. The only direct effect noted was a slight tendency to vertigo or dizziness. The odour of carbolic acid could be readily detected in the breath. The urine of a patient who had taken 360 grains of sodium sulpho-carbolate in twenty-four hours, was collected and examined. It presented no evidence of the presence of carbolic acid, but contained a considerable quantity of sodium sulphate. It showed a marked tendency to resist putrefaction.

"It would appear, therefore, that sodium sulpho-carbolate administered to a living animal is rapidly absorbed and projected throughout the system. In the blood or the tissues the double salt is decomposed, the sodium sulphate being set free in the tissues, and ultimately excreted by the kidneys; the carbolic acid, also liberated in the textures eventually, for the most part escaping by the lungs. It is probable, also, that some portion of the carbolic acid is eliminated by the urine. It follows that the administration of sodium sulpho-carbolate is an indirect means of administering carbolic acid; and inasmuch as at least one-fourth of the weight of the sulpho-carbolate employed consists of carbolic acid, we find that an amount equalling from fifteen to ninety grains per diem can be administered of the latter. It is obvious that the direct administration of this amount of carbolic acid would, from its nauseous character and its difficulty of manipulation, be not readily accomplished; and there would be a danger of the toxic action of the latter being manifest—a result which does not occur when the sulpho-carbolates are administered. One would imagine that, in this latter case, there is a gradual evolution of carbolic acid, which at no time is in sufficient amount to manifest its poisonous action."

Commencing with moderate doses of the sodium sulpho-carbolate, I soon found that, as stated by Dr. Sansom, from twenty to thirty grains, every two hours, could be easily taken by adults for a considerable length of time, without any inconvenience or physiological disturbance of any kind.

I have never in any case encountered vertigo, dizziness, or any symptom that could fairly be attributed to the salt. For the last seven months, every case that has been brought into the Infirmary, or has occurred in my private practice, has been at once put on this treatment. I have now treated upwards of *sixty cases in this way, without* having had one death.

The following is an analysis of fifty cases so treated in the Royal Infirmary.

Of these not one failed to make a perfect recovery. Nineteen were males, and thirty-one females. Their average age was 17·5 years. The average duration of the disease before treatment was commenced was 4·4 days. Dating from the outset of the disease, convalescence with normal temperature had commenced—

In	18	cases	in	6	days.
,,	18	,,	,,	8	,,
,,	5	,,	,,	10	,,
,,	4	,,	,,	14	,,
,,	2	,,	,,	17	,,

In only three cases was recovery long delayed by sequelæ, and in these the sodium sulpho-carbolate treatment was commenced on the sixth, tenth, and fourteenth days of the fever respectively,—too late to prevent the after-effects of the disease. In forty cases no complication interfered with the quick and quiet subsidence of the fever. Albuminuria was observed in five cases: in three of these it merely amounted to a passing trace; in the remaining two it was persistent, and accompanied with blood and renal casts. These two cases are included in the three above-mentioned, in which the treatment was commenced late. Rheumatic pains, which were easily controlled, occurred in three cases. In three there was inflammatory swelling of the cervical glands, which in one strumous child resulted in abscess. In only two cases was any delirium noted: in one it was severe; in the other very mild. In forty-six cases the temperature and pulse fell steadily after the treatment was put in force. In only four was any rise over the first recorded evening temperature noted; in all of these it was insignificant in amount and of short duration. Only one case came under treatment on the first day of the disease; the eruption was coming out, and was well marked. There was another case of scarlet fever in the same house. Treatment was at once commenced, and next day the eruption had disappeared, and the pulse and temperature were normal and remained so. In another case, on the ninth day of the disease the medicine was suspended, the supply having run short. On the same evening, the temperature, which both on that morning and on the previous evening had been 100°, rose to 103°.

The patients who are taken into the Royal Infirmary are for the most part adults. But that the disease does not always run a mild course in such cases may be inferred from the fact, that of twenty-four patients admitted into the scarlet fever wards of the Infirmary during August, September, October, and November, 1874—the four months immediately preceding the commencement of the treatment by the sodium sulpho-carbolate,—no fewer than six died.

Up to this point, the results I have obtained by this method of treating scarlatina entirely support the favourable opinion which Dr. Sansom formed of it from his own experience. I have, however, ventured to go still farther than, in so far as I am aware, anyone who has used internal disinfectants has gone. So marked an influence did this remedy seem to exert on the actual disease, and so well was it tolerated in full doses, and for a considerable period, by all my patients, old and young, without exception, that *I determined some time ago, whenever I met with the disease in my private practice, to give the sodium sulpho-carbolate to all individuals exposed to the infection who were not protected by a previous attack.* For I argued if by internal disinfectants we can destroy or inhibit fever-germs after they have multiplied indefinitely, and produced their pathological effects within the body, may we not reasonably hope that, by previously disinfecting the tissues of the body, the germs which first find their way into them will be much more easily destroyed or paralysed? I therefore hoped thus to be able either to modify or prevent attacks of infectious disease.

To be able so to control the activity of the disease-germs on their entrance into the body, that the resulting attack should with certainty be rendered mild and safe, instead of severe and dangerous, and the patient thus be protected against a future attack, appeared to me the more desirable end to be aimed at. *For to prevent the attack* altogether, however desirable this might *be at the time, would be to leave* the individual still liable to the disease.

The results which I have up till now actually obtained have exceeded my utmost anticipations, and require, I am fully aware, to be recorded and received with due caution.

I have administered the sulpho-carbolate of sodium for the above purpose in doses varying, according to age, from five to thirty grains three or four times a day, and sometimes, when well borne, more frequently to those exposed to the poisons of scarlet fever, diphtheria, and measles. It was given in seven families to twenty-two individuals exposed to the poison of scarlet fever; in three families, to fifteen individuals exposed to the poison of diphtheria; and in three families, to eight persons exposed to the poison of measles. The diseases have not in a single instance extended beyond the individuals first affected. In the cases of scarlet fever, the patients as well as those exposed to infection, were treated with full doses of the sulpho-carbolate; and in this way the infection may have been lessened. The cases of diphtheria and measles were treated on ordinary principles, and the absence of any spread of the diseases in these instances must be attributed either to accident or to the protection afforded by the sulpho-carbolate. I think it right, however, to mention that, although the mortality from scarlet fever has been considerable during the last eight months, I have been informed by several of my professional brethren that cases have not been uncommon in which the disease has remained confined to the member of the family who first took it, and that in some instances the other children, although freely exposed to the poison, have all escaped. I am therefore far from feeling that I have proved, even to my own satisfaction, that by the internal use of a disinfectant we can entirely prevent or modify attacks of infectious disease. The results I have obtained in the above cases are, however, I think, sufficiently remarkable to be recorded, and I now publish them in the hope that during the severe epidemic of scarlet fever which we are likely to encounter during the coming autumn and winter, the plan which I propose, and have to a limited extent tested, may be fully and fairly tried. The question has this further interest attaching to it—that upon its success or failure hinges the whole question of the value of internal disinfection. For if this method is not decidedly effectual at the very outset of the disease, when the poison is small in amount and quiescent, can we expect much benefit from it after the disease-germs have multiplied enormously, and their mischievous effects upon the system have commenced? I have as yet employed only the sodium sulpho-carbolate for the purpose of internal disinfection. Other substances may yet prove equally or more useful, and the plan should be applicable to all the so-called zymotic diseases.—*Medical Times and Gazette, July* 24, 1875, *p.* 92.

4.—ON THE PREVENTION AND TREATMENT OF SCARLATINA AND OTHER INFECTIOUS DISEASES BY THE INTERNAL USE OF DISINFECTANTS.

By Dr. William Scott, Consulting Physician to the Aughnacloy Hospital for Fever and Infectious Diseases.

The possibility of disinfecting living tissues—of neutralising the influence of, if not destroying, disease germs within the body is, perhaps, practically the most important question which either the physician or general public can be called on to consider. That the whole phenomena in infectious diseases are best embraced and explained by the germ theory will, I have no doubt, become clearer and more satisfactory just in proportion to the increased amount of thoughtful attention given to the subject by the intelligent student. Even a non-medical writer, the justly celebrated Dr. Tyndall, arrived at this conclusion, and in his lecture on "Dust and Disease" says: "*From* their respective viruses you may plant typhoid fever, scarlatina, or *small-pox. What is the crop* that arises from this husbandry? As surely as *a thistle arises from a thistle* seed, as surely as the fig comes from the fig, the

grape from the grape, the thorn from the thorn, so surely does the typhoid virus increase and multiply into typhoid fever, scarlatina virus into scarlatina, the small-pox virus into small-pox. What is the conclusion that suggests itself here? It is this: that the thing which we call a virus is, to all intents and purposes, *a seed;* that in the whole range of chemical science you cannot point to an action which illustrates this perfect parallelism with the phenomena of life, this demonstrated power of self-multiplication and reproduction. There is, therefore, no hypothesis to account for the phenomena but that which refers them to parasitic life." But even supposing the able reasoning of Mr. A. Wolff and others, advocates of a different view as to the correlation and causation of zymotic diseases, to be more correct and convincing than to me it appears to be, and omitting all reference as to whether the germ be of animal or vegetable nature, still the object and bearing of this paper would be little, if at all affected thereby. For assuming what at least is highly probable, that there exists a close analogy between the action of such germs or disease-poisons on the one hand, and fermentation on the other, it is easy to perceive how certain chemical agents capable of lessening the activity or of destroying the organisms invariably associated with putrefaction and fermentation should have been used to prevent the spread of infectious diseases, and few, if any, will be disposed to question the beneficial results of such a proceeding, confirmed as it has been by vast experience and overwhelming testimony. And considering how long various substances recognised as disinfectants have been in general use, it is rather surprising that the question as to the possibility of bringing a disinfecting influence to bear upon the disease germs, or by whatever other name the primary influence might be known within the body, was not sooner made the subject of careful investigation. Nor does it seem unreasonable that if living tissues can be so acted on during life as after death to resist putrefaction, we should hope by suitable means to retard or wholly prevent zymotic disease.

Ever since the experiments of Polli with regard to the sulphites of the alkalies preventing putrefaction after death in the animals to whom during life they had been exhibited, and especially since the antiseptic value of carbolic acid had been so undoubtedly established by Professor Lister and others, it occurred to me that some combination of these agents must in all probability prove of inestimable value in the treatment, if not prevention, of those diseases perhaps most dreaded and fatal as regards the young. It was therefore with peculiar pleasure I saw the sulpho-carbolate of sodium had been proposed by Mr. Reeves, and widely introduced to the profession by Dr. A. E. Sansom in the following words:—

"It was found that twenty-grain doses of sodium sulpho-carbolate could be readily administered to adults. So free from taste was the solution that many said it seemed only like water itself. The dose was increased in several cases to sixty grains, administered every four hours. The only direct effect noted was a tendency to vertigo or dizziness. The odour of carbolic acid could be readily detected in the breath. The urine of a patient who had taken 360 grains of sodium sulpho-carbolate in twenty-four hours was collected and examined. It presented no evidence of the presence of carbolic acid, but contained a considerable quantity of sodium sulphate. It showed a marked tendency to resist putrefaction.

"It would appear, therefore, that sodium sulpho-carbolate administered to a living animal is rapidly absorbed and projected throughout the system. In the blood or the tissues the double salt is decomposed, the sodium sulphate being set free in the tissues, and ultimately excreted by the kidneys, the carbolic acid also liberated in the textures eventually for the most part escaping by the lungs. It is probable, also, that some portion of the carbolic acid is eliminated by the urine. It follows that the administration of sodium sulpho-carbolate is an indirect means of administering carbolic acid; and inasmuch as at least one-fourth of the weight of the sulpho-carbolate employed consists of carbolic acid, we find that an amount equalling from fifteen to ninety grains *per diem* can be administered of the latter. It is obvious that *the direct administration of this* amount of carbolic acid would, from its *nauseous character and its* difficulty of manipulation, be not readily accom-

plished, and there would be a danger of the toxic action of the latter being manifest—a result which does not occur when the sulpho-carbolates are administered."

I may here remark that in the numerous cases in which I have prescribed the use of the above-mentioned salt not one presented the slightest symptoms of the vertigo or giddiness referred to as a direct effect of its use. It is not my object at present to enter on any detail of cases, almost exclusively scarlatina, treated by the sodium sulpho-carbolate. I prescribed doses varying from five to thirty grains, according to age, three, four, or five times daily, and invariably with the most satisfactory results. This, however, I feel, may perhaps be partly attributed to a certain number of favourable cases, and ought to be received with due caution. Of nearly equal importance is the probable prophylactic power of the sodium carbolate, and certainly the wonderful immunity which has followed its exhibition in somewhat similar doses to those heretofore mentioned among the attendants and others exposed to the diseased poisons has been fully confirmatory of the theory regarding its antiseptic action, and here I shall quote the words of Dr. Brackenridge, of the Edinburgh Royal Infirmary, an original thinker and actor touching its use : "I have administered the sulpho-carbolate of sodium for the above purpose (disinfecting the tissues) to those exposed to the poisons of scarlet fever, diphtheria, and measles. It was given in seven families, to twenty-two individuals exposed to the poison of scarlet fever; in three families, to fifteen individuals exposed to the poison of diphtheria; and in three families, to eight persons exposed to the poison of measles. The diseases have not in a single instance extended beyond the individuals first affected. In the cases of scarlet fever the patients, as well as those exposed to infection, were treated with full doses of the sulpho-carbolate, and in this way the infection may have been lessened. The cases of diphtheria and measles were treated on ordinary principles, and the absence of any spread of the disease in these instances must be attributed either to accident or to the protection afforded by the sulpho-carbolates." Again: "To be able so to control the activity of the disease germs on their entrance into the body, that the resulting attack should with certainty be rendered mild and safe, instead of severe and dangerous, and the patient thus be protected against a future attack, appeared to me the more desriable end to be aimed at. For to prevent the attack altogether, however desirable this might be at the time, would be to leave the individual still liable to the disease. The results which I have up till now actually obtained have exceeded my utmost anticipations." Among the few, so far as I am informed, who have entertained any real interest in the question of internal disinfection, I am satisfied there is not one who does not feel the necessity for careful extended investigation. A full and fair trial must be made in a vast number of cases, not in a negligent fashion, but with the full conviction that a most important issue is at stake. It is quite possible that some other combination may eventually exceed in value, and supersede the sulpho-carbolate, besides which I have as yet only tried carbolic acid in conjunction with other ingredients in the form of a mixture, but partaking largely of the chemical qualities of the double salt. Three months of zealous intelligent watching and noting on the part of one hundred cultivated minds should be sufficient to amass an amount of experience capable of satisfactorily disposing of a question the solution of which might prove of equal value with the discovery of vaccination. A thousand such at least are within the ranks of the profession in Great Britain and Ireland, and labourers of the right sort cannot be too numerous.—*Med. Press and Circular, Sept.* 15, 1875, *p.* 204.

5.—THE TREATMENT OF SCARLATINAL ANASARCA.

By Dr. J. P. Bramwell, Visiting Physician to the County and City of Perth Infirmary.

[The following remarks are founded upon the treatment of thirty-two cases of scarlatinal dropsy during the last two epidemics of scarlatina which have occurred in Perth, the one in 1868 and the other in 1874.]

Scarlatinal dropsy generally appears between the tenth and twentieth day after deflorescence of the erythema. In some it is ushered in by pyrexial symptoms of more or less severity. As a rule, however, it creeps on in an insidious manner, the first thing that has excited alarm being the dropsical condition of the patient. The urine is lessened in quantity, ranging from three to twenty ounces in the twenty-four hours, and is of a smoky colour, with a disturbed muddy mucous cloud. It deposits sediments which, on microscopic examination, prove to be blood-corpuscles, hollow tube-casts, disintegrated epithelium, and urates, and, in some rare cases, the principal deposit is ammoniaco-magnesian phosphates. In six cases the urine was found to be acid, and contained the former deposits: in one case only was the ammoniaco-magnesia phosphate found. The fact that in some of these six cases uræmia symptoms were shown, does not seem to favour Frerich's theory of uræmia poisoning by the transformation of urea into ammonia. If such were the case we would naturally expect an alkaline condition of urine more frequently associated with uræmia, which in point of fact is quite an exceptional occurrence in the malady.

It is almost superfluous to add, that the urine is always more or less albuminous. In some cases, however, both at their commencement and decline, boiling such acid urine will give no deposit or cloud, while the cold nitric acid test will give a well-marked deposit of albumen. This fact should be duly considered before pronouncing dropsical patients entirely free from danger.

The specific gravity is seldom below, generally above, the normal (1025-1030), thus entirely differing from the albuminous urine of chronic renal disease.

If this dropsical condition remains unchanged, a formidable train of symptoms sooner or later begin to show themselves, and that not always, as Sir Robert Christison has long ago pointed out, in proportion to the quantity of urea excreted. These symptoms are cough, dyspnœa, vomiting (sometimes of grumous blood), dry retching, headache, loss of sight and convulsions; all which symptoms owe their origin to one common cause—the poisoned condition of the blood by the retained urea. The bowels are generally much constipated, and the pulse slow and unrhythmical. If prompt means are not now employed, violent eclampsia generally ensues.

Scarlatinal dropsy is often a fatal malady. From the registrar's returns for Perth, I learn that of every 100 fatal cases of scarlatina, about twenty succumbed to this complication and its consequences. Of the thirty-two cases treated by me, one third never showed any local complications or symptoms of uræmia-poisoning. The greater proportion, however, showed both, and some six or seven had convulsive paroxysms.

Treatment.—When the case was one of moderate severity, and uræmic symptoms not a conspicuous feature, sharp purgation with drastics, such as the comp. jalap or comp. scammony powders, answered very well. It was found, however, that a very large dose was required to produce the desired effect, ʒ ss. or even ℈ ii. of comp. jalap being often required for a child five or six years old. This purgation was alternated by vapour-baths, and at a later period, when a febrile action was diminished, inf. of digitalis with acet. of potash was administered with good results. It will be found, however, that dropsical symptoms in the majority of such cases will persist in spite of all these means, and go on from bad to worse till alarming pulmonary complications show themselves, or convulsions supervene. What now is to be our line of procedure? We venture to affirm, that at this juncture abstraction of blood, either general or local—certainly general when there are convulsions—will act in a *most beneficial manner*, and convert in a short time an apparently *hopeless case into a remediable* one. In order to accomplish this, however,

we must not hesitate to take blood freely, as ten ounces from the arm of a boy ten years of age, or four ounces by cupping over the loins in a child four or five years of age. Neither must we be deterred from this by the supposed anæmic condition which some writers on renal disorders have ascribed to such patients. The truth is, they are not anæmic at all, but are suffering from an acute disorder associated with a very different condition of blood from that existing in chronic renal disorders, and the rapidity with which they recover after sharp antiphlogistic treatment sufficiently shows this. Depletion acts like a charm in convulsions from acute uræmia, and we have seen a free diuresis set up in forty-eight hours after its employment, unaided by any other remedies.

The following is Dr. Graves's opinion of this practice: "By opening a vein in the arm and abstracting a quantity of blood proportionate to the age and strength of patient, you remove the inflammatory state of the constitution, and arrest at once the anasarca and the pectoral symptoms." Generally speaking, cases of anasarca after scarlatina stand antiphlogistic treatment well.

I am interested also to observe, that Trousseau, whose leanings in general are in an opposite direction from bloodletting, makes a special exception in favour of scarlatinal dropsy, thus showing his high powers of discrimination and accuracy as to facts.

It will be found that it is in vain to treat the various complications that occur in scarlatinal dropsy—such as pneumonia, cerebral congestion, hæmatemesis, &c.—as if they were idiopathic affections, seeing each and all of them depend upon a poisoned condition of blood from impaired kidney function. Let this latter condition only be removed by depletion, and the other disorders which depend upon it soon disappear without any special treatment whatever. There are pneumonias *and* pneumonias, there are cerebral derangements *and* cerebral derangements, and we must differentiate the treatment accordingly.

Medicine has fashions as well as other things, and bloodletting, at one time so frequently used and often abused, is now banished altogether. Such great swings of the pendulum, however, generally override the mark; it would be wiser to be a little more discriminating. One is forcibly reminded by all this of a just observation by the late Sir Benjamin Brodie, to the effect that "the progress of medicine is not quite so great as it seems to be, because, while introducing new remedies, we are losing sight of and discarding others old and tried."

Let me further observe, that the adaptability of this remedy is not confined to some exceptionally sthenic epidemics, but has suited well in my hands in the same disorder occurring and recurring at considerable intervals of time. By a fair induction, bloodletting will be found an admirable remedy in all forms of acute uræmia, asuræmic puerperal eclampsia, acute desquamative nephritis, &c.

We have treated thirty-two cases of acute scarlatinal dropsy more or less after this fashion, with only two deaths. One of the fatal cases was seen too late, when no depletion could be thought of. This patient died of acute pulmonary œdema. From the severity of not a few of these cases, and the inadequacy of other means in a considerable proportion of them, there is no doubt in my mind but that several more of them would have terminated fatally had bloodletting not been boldly employed. Let me venture, then, to press this valuable old remedy in this disorder upon the notice of my professional brethren who may not have tried it, especially on the rising generation of physicians, who have been educated, perhaps, too exclusively in an expectant or building-up treatment of all inflammations indiscriminately.

The following cases will illustrate the treatment and the severity of the symptoms in some of the patients:—

Case 1.—A boy, aged eight years, about the fourteenth day of recovery from a mild attack of scarlatina, was seized with dropsical symptoms. He was purged by comp. jalap powder, and ordered calomel ¼ gr., tinct. digit. *m iii., every six hours.* His breathing soon became seriously impeded, and it *was found that he was suffering* from œdema of the glottis. This was

subdued by free swabbing with a strong solution of nitrate of silver and insufflation of alum powder. Urine albuminous, but increasing in quantity. Symptoms of uræmia now supervened, namely, slow pulse, pain in the head, and dry retching. Next day came violent convulsions, at first at intervals, later all but constant. His pulse was pausing every third or fourth beat, his respirations were very hurried and laboured, and, at intervals, a gush of grumous matter like coffee-grounds, composed of altered blood, was ejected through his nostrils. About 8 oz. of blood were taken from his arm, and then chloroform was administered as often as a convulsion fit threatened. On turning him on his side, he became quiet and slept for several hours. A convulsion fit again threatening, chloroform was re-administered, after which he slept continuously till next morning, when he awoke to consciousness. No more convulsions or uræmic symptoms recurred. He soon passed urine freely, the secretion being aided by bitartrate of potash and digitalis, and made a good recovery.

I may mention that this patient belonged to an industrial school in the neighbourhood, and was in one of our Infirmary wards with six other boys from the same institution. By a strange coincidence, two of the other boys became dropsical and convulsed, one being amaurotic, and all but blind for four days, from retinal poisoning. All were bled at the arm, and all recovered.

Case 2.—A boy, aged eleven years, had a mild attack of scarlatina. Ten days after the symptoms began to abate ; he became slowly dropsical without any marked febrile reaction; his urine was albuminous, and contained tube-casts and renal epithelium in abundance, quantity 3 to 4 oz. in twenty-four hours. He was purged freely, had warm baths, counter-irritations applied to the loins, and diuretics, all to no purpose. His anasarca increased, and the quantity of his urine decreased slightly. Symptoms of uræmia beginning to appear, I bled him to 10 oz. Immediate relief followed, and in forty-eight hours he was passing 20-30 oz. of urine in the twenty-four hours. Although this urine continued albuminous, its teadily increased in quantity. He was kept strictly to bed, and had a warm bath every third night for two weeks, at the end of which time his urine was normal in quantity and quality.

Case 3.—A boy, aged six years, became highly anasarcous after an attack of scarlatina ; his urine was reduced to 2-3 oz. daily. Ordered liq. ammon. acet., vin. antimon., and warm baths after his bowels had been opened by comp. scammon. powder. No improvement followed. Infusion of digitalis and acetate of potash were now substituted, but neither skin nor kidneys could be got to act. Next day dropsy was still increasing, face very puffy, scrotum and penis much swollen, drowsy, and complained of his head; symptoms of pulmonary congestion also appeared. Four leeches were now applied to the loins, and a very copious flow of blood ensued : this was aided by hot poultices. The bleeding was difficult to control, and alarmed his parents, but no bad consequences followed. On the contrary, he began next day to pass urine in considerable quantity. A steady diuresis now set in, and the boy made a good recovery.

Case 4.—A little boy, five years of age, was admitted into one of our Infirmary wards with all the symptoms of scarlatinal dropsy. Three members of his family had scarlatina in a latent form, and all became dropsical. The little fellow referred to was quite water-logged, and of prodigious weight, considering his age and height. He was purged freely, and had calomel with digitalis, and mustard poultices applied to his loins, but all to no purpose. He was then cupped to 4 oz. of blood over the loins. In twenty-four hours a free diuresis set in, and soon he began to pass urine in enormous quantities, and made a steady and complete recovery.

I could adduce numerous other cases of this kind, where the beneficial effects of depletion were sufficiently apparent. To do so, however, would extend my paper beyond due limits. I shall therefore conclude with the notes of another case which presented certain exceptionally interesting particulars.

Case 5.—A schoolmaster, into whose school scarlatina had entered, feeling *out of sorts, called in medical aid.* I found his face puffy, pulse somewhat *irregular and slow, urine* reduced in quantity, highly albuminous, and having

a copious sediment of renal epithelium. He was ordered to keep his bed and use comp. jalap powders every third day, with vapour baths between. These remedies, however, did not relieve him, neither did digitalis and potash. In addition to his other symptoms, congestion of both lungs now set in; his sight became affected, mind somewhat confused. At three o'clock in the morning he had a convulsion. On arriving I found him coming out of it, but still confused. I bled him from the arm to 10 oz. Next day, I found him quite collected. The extracted blood was buffy and firm. Next day, secretion of urine was much increased, head symptoms gone, and chest symptoms much relieved.

Three days after the bleeding he had a severe rigor, followed by delirium and phlegmonous inflammation of his arm, which ran on to the formation of pus, and required several free incisions for its relief. The constitutional disturbance was very high, and his life apparently in danger. His urine was exceedingly bloody for several days during this inflammatory attack. He was put on liq. ergotæ with beneficial results. In two and a half months from the date of his first ailing, he was able to resume his duties, the renal symptoms having completely disappeared.

Note.—I am not certain whether this case was one of dropsy following latent scarlatina or acute desquamative nephritis; but in either case it shows that bloodletting is the best remedy when acute uræmic symptoms supervene.—*Edinburgh Medical Journal, July*, 1875, *p.* 36.

6.—ON THE TREATMENT OF SCARLET FEVER BY THE EXTERNAL APPLICATION OF COLD WATER.

By Dr. John Edwin Eddison, Physician to the Leeds General Infirmary, the Fever Hospital, &c.

[The two cases related by Dr. Eddison present no special feature except as illustrative of the treatment adopted—which is used with needless hesitancy in scarlet fever. When the rash is well out, and fever high and temperature excessive, cold is always beneficial. We knew a child with the rash well developed run out of doors in his night-gown only, and throw himself down in the snow which was then very thick upon the ground, rolling about in it. He succeeded in well cooling himself before his mother returned to the room, but he recovered rapidly and well.]

Scarlet fever seems, more than any other acute disease, to lend itself to this treatment. The patients, as a rule, are young, and therefore easily moved about, and the beneficial results are generally more rapid than in the case of many other diseases.

All sorts of objections have been, and still are, urged against the use of cold in scarlet fever. Danger is said to arise from "driving in the rash," from internal congestion, from the rapid loss of body temperature and consequent depression, and it is also said that the risk of renal mischief is thereby increased. If it were proved that the occurrence of nephritis is more frequent after treatment by cold it would be a very valid objection to the practice of it, and the real truth can only be learned by an examination of a large number of cases. From my own experience I am inclined to disbelieve that any harm results in this way. The fear of the occurrence of nephritis from this cause originates no doubt in the generally accepted opinion that the affection of the kidneys so commonly occurring after scarlet fever is due to "draughts," or "catching cold," or to leaving bed too soon. I think this opinion is not founded upon sufficiently good grounds, and that every one in the habit of seeing cases of scarlet fever must often have seen nephritis beginning before as well as after the patient has left his bed, and as often in cases kept in warm stuffy rooms as in those in which fresh cool air has been freely admitted to the sick-chamber. "Catching cold" is made to do duty as a *cause of so many conditions* for which we can find no better explanation, *that it is adopted at once and* without hesitation in order to account for any

otherwise inexplicable phenomena. There appears, at any rate, to be no good ground for assuming that cold bathing increases the chance of an attack of nephritis, and in the two cases here reported the urine did not become albuminous after repeated bathing. Objections on the ground of the trouble and increased expense in nursing are scarcely worth consideration if it is true, as I believe it is, that this mode of treatment is better than any other. The difficulty is perhaps less in treating scarlet fever than in dealing with other cases because the patients are usually young and easily lifted in and out of the bath, but when from the weight of the patient or the weakness of the attendants it is impossible to use the bath, the patient may easily be packed in wet sheets, with or without pieces of ice placed here and there, or india-rubber bags or large bottles filled with ice may be placed round the patient. The bath gives better results than any other plan when it can be thoroughly carried out, and the most satisfactory way is to begin with the bath at 98° or 100°, and cool down gradually to about 70°. It is of course better that the temperature of the patient and of the water should be frequently taken, but the hand is generally a good enough guide as to the water, and the appearance of the patient always indicates the improvement in his condition. This is well illustrated in the case of S. F. (aged eight), near the end of the fifth day. The little patient was then drowsy and delirious, the temperature being 104°, and three-quarters of an hour in a bath, beginning at 90° and cooled down to 68°, resulted in the cessation of delirium and drowsiness, and a reduction of the temperature (in axilla) to 95°. In the case of M. A. S. (aged four), a similar bath for one hour reduced the temperature from 105.3° to 95.6°. There was no dangerous depression or bad symptoms whatever from this low temperature. In scarlet fever, as in other allied disease, the cardiac impulse and the character of the heart sounds are safer guides as to the condition of the heart and circulation than is the pulse at the wrist, the latter being often very deceptive.

In the case of S. F., it will be noticed that the temperature rose again and again after removal from the bath, the rise beginning sometimes immediately, at others after an hour or less. This rapid rise is usual in severe cases, and the benefit derived seems always to be in proportion to the length of time during which the high temperature is warded off. It is worth consideration whether it will not ultimately turn out to be a better plan to keep the patient in the bath for many hours, even for a day or longer if necessary, cooling the water very gradually down, and maintaining it at whatever degree is found to keep the patient's temperature nearest to a healthy point. In the treatment of diseases or injuries of the skin, no evil, but, on the contrary, great good results from much more prolonged baths; and it seems far more reasonable to prolong the period of immersion than to take the patient out and allow the temperature to rise, to be again and again reduced in the same way. I am well aware that unpractised writers like myself often seem to be regardless of the time of their professional brethren, but I trust that the above remarks will not be considered too long nor be found altogether useless. The notes of the cases are, I think, sufficiently detailed and clear to need no further explanation. The first case was one of more than usual severity; and the second, though not quite so serious, was yet by no means a mild case, as a temperature of over 105° and a pulse of extreme rapidity indicate.

I should add that all the baths were begun at a comfortably warm temperature—between 90° and 100°,—and cooled down slowly to about 70°, or sometimes a few degrees below that.—*Lancet, April* 4, 1875, *p.* 340.

7.—ON THE USE OF QUININE AS A GARGLE IN DIPHTHERITIC, SCARLATINAL, AND OTHER FORMS OF SORE THROAT.

By Dr. DAVID J. BRAKENRIDGE, Assistant Physician to the Royal Infirmary, Edinburgh.

Since Binz published his famous experiments, showing the action of quinine on the white corpuscles of the blood, numerous authorities have confirmed and extended his observations. The following facts, among others, may now be regarded as established :—

1. Quinine is a protoplasm poison, and limits the number and movements of the white blood corpuscles and pus cells.

2. It prevents the pathological migration of the blood corpuscles into the tissues of the membranous and parenchymatous organs exposed to the air, both when it is given subcutaneously and when it is directly applied to the part.

3. It restrains the dilatation of the blood-vessels.

4. It is an antiseptic, and exerts a paralysing, or, in larger doses, a destructive influence on microzymes.

With these facts in view, the theoretical appropriateness of quinine as a gargle in diphtheria with abundant proliferation of micrococci, and in scarlatinal, and various other forms of sore-throat, especially when attended with membranous exudation, pultaceous secretion, or ulceration, is apparent. For it antagonises all the visible factors of such forms of inflammation.

Before employing it for this purpose, I was familiar with the use of solution of quinine as a dressing in bed-sores and other tedious ulcers. The marked diminution in the secretion of pus and the rapid improvement which I observed to take place in these cases when so treated, first led me to anticipate good results from quinine as a gargle.

For the last four months I have treated every suitable case of sore-throat that I have met with in my wards in the Royal Infirmary and elsewhere, with a gargle composed, as a rule, of two grains of sulphate of quinine and five minims of dilute sulphuric acid to each ounce of water. Sometimes I have been able to increase the strength; sometimes I have been compelled to diminish it. When well tolerated, the stronger it is the better.

The results I have obtained fully confirm my favourable anticipations. From a considerable number of cases I draw the following conclusions :—

Simple non-syphilitic ulcers of the throat, under this treatment, at once assume a healthier aspect and heal rapidly.

In syphilitic ulcers, the local treatment has always been accompanied by the internal administration of iodide of potassium, or some other suitable constitutional remedy; but my impression is that, in these cases, the cure is hastened by the quinine gargle.

Its effect in the sore-throat of scarlatina is very marked, the pultaceous secretion being checked, and the inflammatory swelling diminished.

It is of comparatively little use in the early stage of cynanche tonsillaris, over which tincture of aconite, in minim doses frequently repeated, has so decided a control. When, however, abscess followed by abundant discharge of pus results, its beneficial influence in checking the suppuration and promoting healing is marked.

In the slighter forms of diphtheritic sore-throat it answers admirably, preventing the extension of the disease, and promoting the separation of the membranous exudation.

It is, however, in severe cases of true diphtheria that I hope it will prove most useful. I have now employed it in three cases of this disease, and in all the result has been highly satisfactory.

I select the following case, because it was one of unusual severity :—

Mrs K., a widow, 25 years of age, previously healthy, passed an open drain on Feb. 5th; remarked the bad smell at the time, and said to her sister, "I am sure I have caught something." Complained of slight chilliness for several days until Feb. 9th, when she was seized with sickness, headache, vomiting, and rigors. Did not feel the throat sore until the 10th, on the afternoon *of which day I first saw her.* She was in the dining-room, dressed, and sit-

ting on the sofa, and had a haggard and very anxious look. Pulse 140, very weak. Tenderness and swelling at the angles of the jaw, and down the lymphatic glands of the neck on both sides. Tongue furred, and breath very offensive. A foul, ragged, yellowish-grey patch, about the size of a florin, covered the right tonsil. The arch of the palate, uvula, and fauces were of a dark livid red colour. Ordered to bed, to take 10 grains of chlorate of potash every three hours, and to gargle the throat with Condy's fluid (a teaspoonful to a tumblerful of water) every half-hour night and day. Milk, beef-tea, sago, and arrow-root to be taken freely.

Feb. 11. Less anxious expression. Pulse rather firmer, 120. Diphtheritic patch looking cleaner and less offensive; but has extended about two lines up towards the uvula.

Feb. 12. A new patch has appeared on the left tonsil, and another at the back of the pharynx, and there is great pain in swallowing. Temperature 103°. Pulse 130. Bowels regular. Beef-tea and milk taken in considerable quantities.

Ten drops of tincture of perchloride of iron to be added to each dose of the chlorate of potash.

Feb. 13. Very great pain in swallowing, chiefly on the right side, left and posterior patches extending, right separating. Uvula still free. Temperature 102.2°.

Feb. 14. Still great pain in swallowing. Diphtheritic patches have extended considerably on the left side; that on the right tonsil has separated to-day. Pulse 120. Has been able to take a considerable amount of nourishment.

Medicinal treatment has been steadily carried out. Has slept between the periods of gargling pretty well up till to-day. Ordered three glasses of port wine in the day.

Feb. 15. Had a restless night. Great pain in swallowing, and the food returns partially by the nostrils. There has been a slight discharge from the nostrils, with tenderness, from the commencement of the disease; it is now sanio-purulent, and acrid. The diphtheritic membranes are still very firmly adherent, and are gradually extending. They now cover all the posterior surface of the pharynx, extending on the left side over the tonsil and left side of the uvula. The right tonsil is clean, tender-looking, and presents a cup-like appearance where the false membrane has separated.

The following gargle was ordered to be used alternately with the Condy's fluid every half hour:—

℞. Quiniæ sulphatis, gr. xviii.; acidi sulphurici diluti, ℥ xlii.; aquam ad ʒ vi Misce.

This at first produced retching, and had to be diluted with an equal amount of water. A gradual return was made in a few hours to the full strength, which was afterwards well borne.

Feb. 16. Decided improvement. A good many portions of the false membrane have become detached during the night. Pulse 100, and of better strength. The tongue is cleaner, and the swelling of the throat is much less. The swellings at the angles of the jaw have quite fallen, and the throat altogether looks better. Patient attributes the improvement to the new gargle; has had a good night. She fancied and enjoyed a cup of tea this morning for the first time.

Nine o'clock p.m. A good many shreds of false membrane have become detached during the day, and the whole affected surface looks healthier. Considerable pain attended the separation of the sloughs during the afternoon. Temperature 100.4°. Pulse 108.

From this date the throat symptoms steadily and rapidly improved; and on the evening of the 18th the diphtheritic false membrane—the last trace of which was seen in the forenoon hanging loosely from the posterior surface of the pharynx in the middle line—had entirely disappeared.

The paralysis of the veil of the palate, which commenced on *Feb. 15*, culminated in general paralysis of great severity and duration, from which the patient is only now *(June 16) slowly* recovering.

The intensity of the poison must have been great. On the first day of the

disease, a little girl, residing in the house, was sent away to the village of Dunoon, on the Clyde, to be out of danger. She escaped herself, but carried the poison to a younger sister of the patient (Mrs. K.), who took the disease and died after six days' illness.

I have found the quinine solution useful as a wash in aphthæ, stomatitis, and other affections of the mouth; but my experience of it in these cases has been limited by the difficulty attending its use in childhood, owing to its very bitter taste.—*Practitioner, August*, 1875, *p.* 110.

8.—ON THE PATHOLOGY AND TREATMENT OF CHOLERA.

By Surgeon A. R. Hall, Army Medical Department.

[The following paper was read before the Royal Medical and Chirurgical Society, Oct. 13, 1874.]

The encouraging success that has attended the treatment of the cold stage of cholera by the hypodermic injection of chloral hydrate in the cases in which it has been tried, induces me to bring the subject before the notice of the medical profession in England. The fact that the Government of India attach so much importance to the matter as to have published letters from Mr. Higginson, the Civil Surgeon of Kheri, in Oudh, and myself, concerning it, in their official Gazette of Feb. 14, 1874, is also very satisfactory. These reports were published in a letter in the Times of August 15, 1874.

During a continuous service of upwards of eleven years in Bengal, I have seen a good deal of cholera. I have suffered from it myself; and I think it may be of interest to describe, as tending to throw some light on the pathology of the disease, what paticularly struck me in my own symptoms, and the conclusions I have drawn from them and from the writings of various authors.

While doing duty with troops who were suffering from an epidemic, in April 1864, I had a severe attack. The first thing that I specially noticed was the entire absence of all griping, colic, or straining, while the purging was going on. The stools seemed to be expelled by the contraction of all the muscular fibres of the intestines themselves, without any assistance from the abdominal muscles. I noticed that my pulse was hard and then small before it ceased to be felt at the wrist. But what struck me as curious was the fact that my heart was beating forcibly all the time! The absence of pulse therefore did not seem to me to be caused by exhaustion of the heart's power, or a tendency to syncope.

The cramps in my arms and legs were very torturing. There was total suppression of urine for about twenty-four hours. My voice at first was rather shrill and *squeaky* before it became what is called *sepulchral*. The rice-water evacuations were ejected at frequent intervals, and the vomiting was almost incessant. I craved for liquids, and drank cold water and soda-water for a time, only to expel them with a spasmodic rush. I did not experience any *nausea;* when the fluid reached the stomach it seemed to be expelled by the rapid contraction of the muscular coats of that organ. I am thankful to say no stimulants were given to me, and I lived through the attack. I retained my consciousness the whole time, and recovered without much secondary fever.

After this experience I naturally took more interest than ever in studying the disease. The writings of Dr. Brown-Séquard seemed to me to lead to the conclusion that *irritation* of the vaso-motor portions of the sympathetic nervous system would account for many, if not all, the symptoms of the collapse of cholera. When I read Mr. George Johnson's "Notes on Cholera," I felt convinced that the *asphyxia* produced by the contraction of the pulmonary arterioles was apparently the chief condition to be overcome.

Without indulging here in speculations as to what *causes* cholera, I think *I may say* that the comparative rapidity with which persons who survive an *attack generally regain their* health, tends to prove that no serious *permanent*

nges have taken place, either in the blood or the intestinal canal. When gen can gain free access to the blood, and water is supplied in sufficient ntity, the blood seems to be able to perform all its functions properly.

Parkes, years ago, denied that the turbidity of the rice-water evacuations occasioned entirely by the presence of epithelium, and the recent investations of Drs. Lewis and Cunningham, in Calcutta, confirm the denial.

We have then, apparently, to deal with some morbid influence which acts h fearful violence for a time. It often kills rapidly, but if the patient s not succumb, he gets well pretty quickly. The question is—What state ie actually in, and what can be done to keep him alive?

In May, 1869, I wrote a paper, entitled "Thoughts about Cholera," which s published in the Indian Annals of Medical Science for March, 1870. me months previously, a number of printed questions had been circulated, be answered by various medical officers in Bengal, in order that the diffeat opinions held on the subject might be recorded. One of the questions as:—Does collapse depend upon paralysis of the sympathetic nerve? To is I wrote "No." Dr. Brown-Séquard sums up the results of his wellnown experiments by asserting that the parts supplied by the sympathetic, hen that nerve is *divided* (or *paralysed*), show: (1) Dilatation of blood-vesls; (2) Afflux of blood; and (3) Increase of vital properties; while galvasation of the nerve is followed by (1) Contraction of blood-vessels; (2) Diinution of blood; and (3) Decrease of vital properties. It seemed to me nerefore to be more probable that the sympathetic nerve is in an *irritated* tate, rather than paralysed.

I think that the different symptoms of the collapse of cholera lead to the onclusion that the morbid influence (whatever it may be) exercises a stimuating action on the vaso-motor portion of the sympathetic nervous system, roducing increased heart action, contraction of the muscular walls of the rteries, and, at first, augmented blood-pressure. The increase of arterial tenion is first shown by a hard pulse. This afterwards becomes small, because here is very little blood in the artery. I am sorry that I have not been able o obtain sphygmographic tracings of the pulse as yet. Dr. Parkes has pointed out the frequency of copious micturition of limpid urine at this early period. This flow has been shown by Traube to be intimately related to high arterial pressure; but when the state of muscular activity passes on into cramp-like spasm, there is total suppression of urine. This is probably due o complete closure of the renal arterioles.

A sensation of burning heat at the epigastrium is often experienced in collapse. This may be due to a hyperæmic condition of the solar plexus. The condition of irritability of the sympathetic produces, through its vaso-motor nerves, spasm of the muscular coats of *all* the arteries of the body. *The heart contracts forcibly, but cannot dilate normally, its muscular walls being spasmodically affected.* This is a point that I wish to bring prominently forward. I believe that the irritation and hyperactivity of the vaso-motor portion of the sympathetic is so great that the *inhibitory* or dilating action of the vagus on the heart is not able to control it.

Dr. Aitken, noticing the appearance of the heart after death, as observed by Dr. Parkes, writes:—"The right side of the heart and the pulmonary arteries were generally filled, and in some cases distended with blood; the left side and aorta were generally empty, or contained only a very small quantity of dark blood; the left side evidently had received little or no blood, but had continued to contract, in some cases even violently, on the last drop of blood which had entered it." I fancy that both sides of the heart are influenced the same way by the same causes, and contract violently. The left heart gets very little blood sent over to it by the right heart, in consequence of the contracted pulmonary arterioles, and is therefore comparatively empty; though, while life lasts, it must get *some* blood. The right heart gets a considerable quantity forced into it by the gorged vena cava and other systemic veins, but cannot send it into the lungs, also because of the contracted pulmonary arterioles. It is therefore full of blood, and is found so after death.

We have then, I presume, the following conditions:—At first increased

blood-pressure, caused by the heart beating strongly, forcing the blood through contracted arteries. As the disease advances, the heart, though contracting forcibly, gets very little blood from the lungs, and therefore has only that little to send into the arteries. The systemic veins are gorged with blood, which occasions the *blue* colour of the face and surface of the body.

The peculiar choleraic voice is one of the first symptoms that attracts attention in this disease. One thing seems evident, that this peculiar voice does not depend on deficiency of air entering and leaving the lungs. If a cholera patient is desired to take a deep breath, he can generally do so. A considerable quantity of air is heard rushing into the thorax, and if one's hand is put to the mouth, the breath can be felt coming out pretty strongly, only very cold. I cannot help thinking that we must attempt to explain the existence of this voice by the effect produced on the larynx by the abnormal condition of the nerves which supply its muscles.

Violent cramps in the voluntary muscles are felt in most cases, which occasion the real pain in collapse. Dr. C. B. Radcliffe, in "The Dynamics of Nerve and Muscle," says that contraction of muscle is a temporary death. It is, in fact, an imperfect *rigor mortis*, which condition is seen so strongly marked in persons who die in collapse. The cramps in cholera may therefore be caused by the cutting off of the blood-supply to portions of the muscles by the contracted state of their arterioles.

The vomiting is apparently due to spasm of the coats of the stomach caused by the hyperactivity of its nerve-supply ; and the evacuations from the bowels may be the result of exudation from the distended venous radicles of the portal system, which partake of the general venous engorgement ; for Niemeyer has shown that when the arteries are contracted there is venous distension. I am aware that many facts have been observed which go to prove that the rice-water fluid is the result of *secretion* and not of transudation. The celebrated experiments of Moreau bear particularly on the point. Lately, in this country, Dr. Lauder Brunton has been carrying out a series of experiments on the nerves supplying the intestines, some of which he was kind enough to allow me to witness, and for which I take this opportunity of thanking him. But time will not permit me to go into this question here, and I beg, for the present, to leave it an open one. It is clinically interesting to know that the purging is not accompanied by any of that pain known to us as *colic*. The intestinal activity of cholera is absolutely painless. The *packed* condition of the intestines (in which they are seen drawn back to the spine, and occupying much less space than usual in the abdomen), described by Sir William Gull and Dr. Baly, is probably produced by great contraction of *all* the longitudinal as well as the circular fibres. *But I look upon the vomiting and purging as of secondary importance.* The worst cases, those of so-called *cholera sicca*, appear to die of *asphyxia* before much fluid can be thrown out by the stomach and intestines ; for though rice-water fluid is found in the intestines in these cases after death, there is nothing like the quantity that is often expelled during life in other and less severe cases. According to my idea, the morbid influence is expending its force most fatally on the heart and lungs, through the vaso-motor centres, and to these our whole attention must be directed.

It is also a matter of clinical fact that in the worst cases there is absolute suppression of bile secretion and urine. These facts point to the spasmodic condition of the arterioles of the liver and kidney. The blood is shut off from the liver cells and Malpighian tufts. The gall-bladder, however, is usually found full, or half full, after death. The general condition of spasm of the involuntary muscular system has probably involved the circular fibres of the bile-duct, and so prevented the bile (which had been secreted since solid food was last taken, and before the state of spasm had set in) from being poured into the intestines.

The urinary bladder is generally contracted to the "size of a walnut," as has been remarked.

It has also been observed that abortions frequently occur in pregnant wo*men when attacked by cholera*, and that the fœtus has been often expelled

alive, proving that the miscarriage was not caused by the death of the embryo. Of course, the contracted state of the mother's blood-vessels may cause the death of the child in time by stopping the utero-placental circulation; but I fancy that the uterus often contracts before this is brought about.

One of the chief peculiarities about this disease is, that while such fearful disturbance is going on in the body, the intellect is generally unaffected. If there was really a tendency to syncope, we should probably oftener see loss of consciousness.

I now beg to bring forward what I consider to be the right principle on which to treat collapse of cholera. Presuming the morbid state against which we have to contend to be one of asphyxia, caused by spasms of involuntary muscular fibres, due to a condition of hyperactivity of the sympathetic nervous system, the logical inference distinctly points to the exhibition of a remedy calculated to neutralise this condition. Such remedies are to be found in the class of agents which directly depress the activity of the muscular fibres of the circulatory apparatus.

In my paper above referred to, I pointed out that it is no good giving medicines by the mouth, as they are generally immediately rejected. I suggested the *hypodermic injection of pure sedatives*, which, if given in sufficient quantities, actually do produce syncope by their palsying action on the heart. When I wrote that paper chloral hydrate had only recently been discovered.

In India, medical men do not enjoy the same opportunities of getting the newest remedies and profiting by the latest discoveries as their more fortunate professional brethren in England. At that time I had never seen chloral hydrate, and did not know what its real therapeutic action was.

I enumerated the sedatives, as given in Dr. Headland's "Action of Medicines," which I thought might be useful, viz., tartar-emetic, ipecacuanha, digitalis, aconite, hydrocyanic acid, and some others. But tartar-emetic and ipecacuanha are too irritating to the *skin itself* for hypodermic injections, and digitalis has been proved by Dr. Milner Fothergill to be a direct cardiac stimulant. I procured Dr. Fothergill's essay in 1872, and Surgeon-Major Collis (of "The Buffs") and myself performed a number of experiments on bull-frogs (about 1½ lbs. in weight, and twelve inches in length) with digitalis and other drugs, which produce an effect on the circulation through the nervous system. We found that chloral hydrate caused the death of the frogs, with the heart in the most *complete diastole*, thereby proving that it is one of the most powerful vascular sedatives that we possess.

It so happened that I had not an opportunity of trying the hypodermic injection of a pure sedative till August, 1873. I then had a soldier in collapse under my care. I dissolved ten grains of chloral hydrate in 100 minims of water, and injected this quantity under the skin of the arms, in four different places. The record of this case will be found in the Indian Medical Gazette for November, 1873. Reaction was established in about five hours, and the patient made an excellent recovery, without any inconvenience from the punctures.

In September, 1873, Mr. Higginson, the Civil Surgeon of Kheri, in Oudh, treated nineteen cases on this plan, and only two died (one of whom might probably have been saved if the native doctor left in charge had carried out his instructions.) The letters preceding this paper refer to seventeen of these cases. These results speak for themselves. Of course a great many more cases will be required to prove the efficacy of this treatment, but at all events it is a good beginning.

I attach great importance to the strength of the solution used; one part of chloral hydrate to ten of water. If it is stronger than this it will probably not be absorbed into the blood, and only cause ulceration, or perhaps sloughing. Mr. M'Reddie, the Civil Surgeon of Hurdui, in Oudh, reported unfavourably on the hypodermic method, in the Indian Medical Gazette for December, 1872; but he dissolved twenty grains of chloral in sixty minims of water, which was much too strong.

I cannot here go into the subject of the secondary fever. I believe this to be a condition closely *allied to heat* apoplexy, and will only say that it would *appear probable that the activity of* the muscular walls of the blood-vessels

is followed by a period of relaxation. This really is a partial paralysis, the result of exhaustion. In this dilated condition of the systemic arterioles, I have found quinine and a combination of stimulants and tonics to be the best treatment.

I hope now that I shall awaken sufficient interest in favour of the *sedative treatment of choleraic collapse*. When we hear sometimes of 80 per cent. of *those treated* dying, it is high time that some other plan than the usual stimulating one should be tried, and I believe that, practically, the subcutaneous injection of chloral hydrate is the best to adopt. All I ask for is a fair impartial trial. If this plan fails, it will share the fate of numerous predecessors ; but if it really answers, and is proved to be a successful mode of treatment, it will not only save many lives, but will allay the sickening panic that spreads like lightning among a population when any of their number are stricken with malignant cholera, the greatest scourge of modern times.—*Practitioner*, *July*, 1875, *p.* 5.

9.—ON THE ORIGIN OF CANCER.

By the Editor of the Medical Times and Gazette.

Dr. Creighton's "Anatomical Research towards the Ætiology of Cancer," in Mr. Simon's late Report on Scientific Investigations, would appear to be one of the most important contributions that have been made for years on the subject of malignant growths. It is not simply that a number of new facts concerning cancer have been satisfactorily determined : the problem of the origin of the disease has been attacked from an entirely new side, and the significance of certain appearances that had not escaped the acute observation of previous pathologists has thus been discovered. Further, by judiciously employing his results, Dr. Creighton has been able to examine and discuss the present conflicting theories on the origin and nature of cancer ; and to construct a theory of his own, which, without compromise in any form, has reconciled much that previously seemed irreconcilable.

It is well known that there prevail at present two leading theories of the origin of primary cancer. One of these, held notably by Waldeyer, represents cancer of epithelial structures as a growth of a typical epithelium ; while the other, maintained especially by Virchow, rejects the epithelial origin, and assigns the origin of the epithelial-like cells of the tumour to an epithelial infection of the connective tissue. Again, with respect to secondary tumours —for example, in the liver—the current explanations of their origin may be said to be two : the first, that the new growth is due to the multiplication of cells that have migrated to the part ; and the second, that it is due to the transformation of certain pre-existing elements of the organ. Virchow, as is well known, adheres to the latter view, and holds that the connective and not the parenchymatous element of the part is the one that is transformed. There are thus two distinct problems to be solved regarding the ætiology of cancer—the origin of primary, and the origin of secondary tumours. That the two problems are most intimately related to each other is immediately obvious ; as it equally is that their solution will to a great extent answer the broader question of the essential nature of cancer.

The originality of the course pursued in the present research is here to be noted. Reversing the ordinary plan of investigation, Dr. Creighton began by selecting for examination not primary but secondary tumours. There are two advantages in this choice. The beginnings of primary tumours are most difficult, or even impossible, to discover, for their seat has too frequently undergone previous morbid alteration. Secondary tumours, on the contrary, appear in organs, such as the liver, which are probably perfectly healthy otherwise. The tissue of these organs is a "neutral ground," on which the most various of malignant tumours may manifest themselves and display their *characters* ; and further, especially if the liver is affected, numerous separate *nodules may generally be* found, exhibiting every stage of development.

Dr. Creighton states, to begin with, that he uses the name "cancer" in the sense, which it conventionally conveys in this country, of malignant tumour. He then proceeds to describe the plan that he has pursued in the investigation, and the results that he has obtained from the microscopic examination of secondary cancer of the liver. These we shall now give as briefly as possible.

It may be stated in a single sentence that the liver-cells are found to be transformed into cancer-cells by a process of vacuolation of their protoplasm, with other associated changes. The process of vacuolation, which, according to Dr. Creighton, occupies such an important part in the development of secondary tumours, has long been familiar to physiologists and pathologists, although it is only within the last few years that it has attracted the attention that it deserves. Histologists have carefully described the appearance of a vacuole or cavity in the protoplasm of a cell; the lateral displacement or even disappearance of the nucleus; the disposition of the protoplasm as a distinct wall bounding the vacuole (often with a signet-ring appearance); and the development within the vacuole of various important contents, fluid or solid. Many of the first bloodvessels in the embryo are thus developed, the vacuole-wall remaining as the vessel-wall, the cavity constituting the lumen, and the contents the blood. There is also good reason for the belief that the nucleus-cavity of the ovum is an ordinary vacuole, and that the first changes on the fertilised ovum are vacuolation of the protoplasm and its results. Now, these changes in the ovum have been generally described as "endogenous cell-formation," and, as Dr. Creighton points out, this is but another name for vacuolation. Virchow demonstrated, years ago, the importance of endogenous cell-formation as contrasted with ordinary growth by division, and we will again refer to the significance of the two processes. More recently, since Cohnheim's great discovery of cell migration, the appearance of cells within a vacuolated or mother-cell has been otherwise explained. The view has been advanced that the contained cells have migrated into that position from without—perhaps from the vessels; and there is probably little doubt that this really may occur. The attractive speculation has hereupon been raised that wandering-cells, or at least some wandering-cells, are spermatic in their nature and effects; that they wander like spermatozoa until they find a suitable soil; and that, making their way into the protoplasm, they fructify it, and so determine the changes which the cell subsequently undergoes.

To return now to the results of the present research. It was found by Dr. Creighton, on carefully examining a secondary nodule in the liver with the naked eye, that its section presented an outer zone of a different colour; this was bounded internally by the tumour-tissue proper, and externally by normal liver-tissue. This zone was found to be "liver-tissue in a state of vacuolation." Vacuolated liver-cells occurred in every stage of development, and with various contents. The position of the vacuole cells was *prima facie* evidence of their relation to the formation of tumour-cells. But there was also particular evidence. The vacuole-cell either remained as a small, round, indifferent cell, which had occupied the vacuole-cavity; or it broke up in such a way that the peripheral thick mass became detached from the slender ring, the latter then atrophying, and the former remaining as a tumour-cell or it became filled with a pale, granular protoplasm, constituting a tumour-cell. Now, all these cell-products of vacuolation were in relation both with the liver-cells and with the tumour-cells—in definite local relation with both. All the varieties were observed, as a rule, lying together, as well as giant-cells. Sometimes, again, the indifferent cells became connective tissue of one or other kind.

It cannot be denied that this is very powerful evidence in favour of an intimate relation between vacuolation and the formation of tumour-cells. Accepting it as sufficient, let us estimate the importance of the conclusion. Many years ago, Virchow, in speaking of cell-growth, introduced the terms *hyperplastic* (as a substitute for *hypertrophic*) and *heteroplastic*. He writes in the "Cellular Pathologie"—"Es sind in der Pathologie zwei gesonderte Typen der Neoplasie zu unterscheiden: der Wachsthumstypus und der Zeugungstypus." There *is cell-formation* by division, which is a hyperplastic *process, the new cell being* merely a repetition of the old; and there is en-

dogenous cell-formation, which is a metaplastic process, the product departing from the type of the parent cell, and acquiring differential characters of its own. Now, in Dr. Creighton's cases, it "was found that the results of the vacuolation process in the liver corresponded with the results to be looked for from endogenous cell-growth." Among the resulting cells were found giant-cells, or spindle-cells, or columnar epithelium, each being different from the parent cell. "The law of the continuity of the tissues, which would have been observed in the purely hyperplastic mode of cell-formation, was abrogated by introducing the factor of endogenous cell-growth." It is unnecessary for us to insist upon the importance of this conclusion. By the pathologist it will be eagerly received and tested; by the disciples of the school of Virchow it will be accepted with natural hesitation, for it must give a rude shock to the cellular pathology.

The question next arises, How is this process of endogenous cell-formation induced in the liver? There is abundant evidence that primary and secondary tumours bear a distinctly genetic relation to each other. The primary precedes the secondary in point of time; a remarkable family likeness can, in most instances, be traced between them; and, what is even more significant, the process of endogenous cell-growth, by which the secondary tumour is developed, bears a striking resemblance to the first changes in the ovum after impregnation. For these several reasons, it must be granted that the influence of the primary or parent tumour may be assumed in any attempt to offer an explanation of the origin of the secondary. This influence is extraneous to the seat of the secondary growth, and Dr. Creighton has shown that it operates by the mechanism of endogenous cell-formation. We cannot but acknowledge the remarkable fitness of the comparison which Dr. Creighton finds himself entitled to draw between this extraneous influence and spermatic influence; while we confess with him that the manner in which it is produced by the parent tumour is unknown. On the whole, it must, we think, be allowed that Dr. Creighton has established his theory of the origin of secondary malignant tumours on a sound physiological basis.

The application of the theory does not stop here; it may be extended to *primary* cancers of epithelial parts. We have already given examples of the occurrence of vacuolation in the normal organism, and there are many more that may be adduced. Thus the salivary and mucous corpuscles, and, to speak more generally, all "goblet-cells" found on mucous surfaces, are probably products or stages of vacuolation. The product of the process is often fluid, and called a "secretion;" but it may be solid—for example, spermatozoa,—or both, as in most instances it is. In every case it may be considered as the result of an endogenous cell-formation, and so essentially heteroplastic. The bearing of this conclusion on the question of primary malignant tumours soon becomes apparent. The fact that the product is in some instances solid or protoplasmic, and in others partly protoplasmic—as *e.g.*, in the colostrum-corpuscles—permits of the conclusion that "in the exercise of the glandular function there may be produced on occasion, from the epithelium, elements that are not themselves true epithelium, and that are, in fact, heteroplastic." We have already referred in the beginning of this article to the rival theories of Waldeyer and Virchow on the origin of primary epithelial cancer. There has been gradually accumulating strong evidence in favour of Waldeyer's view, that epithelium is the point of departure; but it has remained for Dr. Creighton to reconcile with this the firm belief of Virchow in "the primary heteroplasie of all cancers." Dr. Creighton has shown by the preceding argument, that the cellular product of secreting epithelium should probably be regarded as no longer epithelium, but a heteroplastic product, and that by virtue of the law of endogenous cell-formation.

Important as are the results that we have reviewed, they are manifestly but a small part of what may be expected from a thorough investigation, from the same point of view, of the different glands of malignant growths connected with them. Dr. Creighton has promised to publish the result of such a research on the mamma and mammary tumours, and we shall look with much interest for its appearance.—*Med. Times and Gazette, Sept.* 4, 1875, *p. 268.*

10.—CONTRIBUTION TO THE STUDY OF NON-CANCEROUS TUMOURS OF THE BREAST.

Dr. CHARLES MONOD, Chef du Laboratoire de l'Hôpital des Cliniques. (Translated by CHARLES J. CULLINGWORTH, Esq., Surgeon to St. Mary's Hospital, Manchester.)

The anatomical diagnosis of true cancer of the breast is seldom beset with y difficulty. It appears most frequently, in fact, with characters precisely e those which it bears in every other region of the body ; a fibrous frame- rk, forming alveoli, in which are enclosed cells of variable form and size. rther, and upon this point we are wishful to insist, the constituent ele- nts of the mammary gland, its *acini* and excretory ducts, disappear before e development of the cancerous tissue.

Nevertheless, in certain cases, where the entire breast is not yet invaded the pathological product, gland-tissue can be met with intact at the bor- rs of the tumour. With fortunate and sufficiently extensive sections, one ay perceive, in fact, at one end of the preparation, cancerous tissue, recog- sable by the characters enumerated above; at the other, some gland lobules normal size and appearance. The neighbouring tissue, and this more and ore as the seat of complete degeneration is approached, presents traces of a anifest alteration, in which the first stage is an abundant cell-proliferation. ell-elements appear on the field in increasing number and size. Here and here they form little groups, and are located between the bundles of con- ective tissue, which seem to open out for their reception. Here evidently seen the first stage of the alveolar formation of the cancer. These rudi- entary alveoli may sometimes only contain one or two large cells.

The lesion continuing its march of invasion, the cells continually increase in umber and size, and the spaces which they occupy enlarge in proportion, and ecome more and more numerous. Little by little also the gland-lobules, itherto intact, disappear, obliterated as it were by the march of the pathologi- al process.

Thus the point is arrived at by degrees where the alveolar tissue of the can- er alone exists; the glandular tissue has entirely disappeared.

Quite different is the physiognomy of the non-cancerous tumours of the reast. Here the gland-tissue persists, altered in form it is true, but yet always ecognisable by means of the regular epithelial coat which lines the enlarged land-spaces.

This persistence of the gland-tissue explains the confusion into which many uthors have been led, and the numerous cases described under the title of ade- nomata of the breast. We shall endeavour to show that the characteristics of these tumours must be sought for, not in the glandular element, always more or less perverted, but in the intermediate tissue; and that the exact analysis of that tissue alone permits us to define their nature with precision.

We are aware that this mode of meeting the question before us is not new, and has been already partially set forth in previous publications. Recent discussions, however, having shown that it was far from being sufficiently known and popu- larized, we have thought that it might perhaps be useful to take advantage of our personal researches, in order to bring it once more into prominence.

Non-cancerous tumours of the breast, clinically very different from each other, present certain common anatomical characters which allow of their being brought together, and show, on the other hand, important differences which justify the recognition of a certain number of varieties amongst them. Their physical characters are very variable, and in no way help to place them in distinct categories. It will be sufficient to remember in fact, that they include the largest and the smallest breast-tumours; that their consistence, which generally reaches neither the softness of encephaloid nor the hardness of scirrhus, may for the rest vary considerably; that their form is still less character- istic. Nevertheless, to the unaided eye, they all present one character in common, which has not escaped careful observers.

The fundamental tissue of the tumour, even when it appears at first dense and of homogeneous structure, is traversed by numerous clefts and furrows: some *scarcely appreciable by the* unaided eye; others quite visible and admit-

ting a probe easily; others again, still more considerable, may open out into actual cavities of a cystic appearance, and of an elongated or rounded form. It is usually easy to make out that these cavities communicate with each other here and there; others, on the contrary, appear completely isolated. The largest often contain in their interior a mammilated projection in form like a mushroom, which seems to be developed at the expense of one of their walls. This projection itself presents a pinked or furrowed (*déchiquetée*) surface; it is subdivided into a great number of lobes, and smaller and smaller lobules, which give it a cauliflower aspect. The tissue of which it is composed, appears on section of the same nature as the rest of the tumour. Frequently, however, it is of softer consistence, and may even, according to the variety to which it belongs, be in process of softening.

We shall see presently that this papillary appearance, which only reveals itself to the unaided eye when these vegetations have acquired a large size, is found under the microscope throughout the whole of the tumour, in different stages of development, from the simple upraising of the cyst-wall to the completely formed papilla.

[It is fully proved at this day that these hollow spaces, whose existence had not been overlooked by those occupied with the study of breast-tumours, are no other than the gland-cavities of the breast, abnormally developed and altered in form by the pathological tissue which has arisen in the gland. They have been described by M. Ranvier, under the name of *kystes lacunaires*, to distinguish them from true cysts, such as may be met with in tumours of the breast.

All these cavities present a perfectly smooth surface, which recalls in every particular the appearance of an epithelial surface. It is easy, indeed, to show that they are really covered by epithelium. For this purpose it is sufficient, if the tumour has been recently removed, to let fall into the cavity of one of these cysts a solution of nitrate of silver 3 parts to the 1000; when permeation has occurred, a thin fragment of the cyst-wall is placed under the microscope, the section being parallel to the surface. An epithelial layer is at once recognised, in all respects similar to that which the wall of a normal gland duct would furnish under similar circumstances. This epithelium is found also on examination of thin sections under the microscope, made after hardening. These are the results furnished by this second mode of study, which we must now describe. We have no need to insist in this place upon the inadequacy of preparations obtained by the scraping of specimens in the recent state, or the crushing of small fragments torn from the surface of the tumour. By this means epithelial cells are easily obtained from the gland-ducts, often grouped indeed in a manner which gives a true cast of the culs-de-sac; and one is thereby led quite naturally to make an anatomical diagnosis of a glandular tumour or adenoma. The elements of the intermediate tissue between the culs-de-sac most frequently in fact are overlooked by that mode of examination; either because being very firmly placed in the situation they occupy, they are less easy to remove by scraping; or because being less characteristic in form, they attract less attention.

An examination of the liquid collected by means of scraping (and particularly that obtained from a fragment which has been in Müller's solution for twenty-four hours) is not without its use. Only in that way can the elements of the tumour be observed in a state of isolation, and accurate ideas be gained with regard to their form and size.

But in order to form a complete anatomical diagnosis, the analysis must be carried further; it is not in reality the observation of the isolated elements of a tissue, but of their mutual arrangement, which will permit us to come to definite conclusions as to its nature. The examination of thin sections taken from a mass suitably hardened, and coloured in the ordinary way, ought then always to follow that of the tumour in its recent state. After colouring similar preparations with the picro-carminate of ammonia, an arrangement at once strikes us which recalls and explains what had been noticed during the examination of the tumour with the unaided eye. We see at the first glance, with a low power, *that the pathological* tissue is traversed by numerous cavities or empty spaces, *bordered by wavy lines of* a deep red colour, contrasting by their staining with

the surrounding parts. With a higher power it is easy to note that these deeply-coloured lines, which form the borders of the hollow spaces in the tumour, are composed of prismatic epithelial cells, in regular rows and in a single layer. These hollows and epithelial surfaces evidently correspond to the more or less altered glandular structure of the breast. It is indeed possible to perceive by the side of hollow spaces of considerable diameter, where it is difficult to recognise the proper structure of the transformed gland, true gland-tubes which have preserved their normal texture and appearance, presenting themselves in the form of longer or shorter ducts, without any appreciable cavity, owing to the exact apposition of their opposite walls, and dividing several times at one end, recalling in short the aspect of a glandular canal leading to a vesicle (*acinus*). At other times the tube-walls are separated from each other; they then appear elevated by more or less numerous *papillæ*, as if the surrounding tissue were trying to force its way into their cavity.

Lastly, these glandular spaces have, further on, become quite unrecognisable; partly on account of the enormous dilatation they have undergone, and partly on account of the existence in their interior of projections of gradually increasing size. The presence of the epithelium above described is the only point in common which unites them together, and allows these diverse forms of the same lesion to be approximated.

Between these three every intermediate degree may be observed, differing one from another only in the greater or less dilatation of the cavities, or the more or less considerable budding of the walls. This appearance, with differences of detail, may be found in tumours which, as we shall show immediately, are yet of an entirely different nature. Nevertheless, one may say in a general way, that the more rapid the development of the tumour has been, or the more remote the examination from its commencement, the fewer gland-tubes of nearly normal aspect will one find, the more considerable, on the contrary, will be the hollow spaces and the budding of the walls.

Finally—and this is the point upon which we are chiefly wishful to insist—it follows from these facts that, as we have indicated above, it is not in the glandular element that the distinctive characters of the different tumours of the breast ought to be looked for. These distinguishing characters can only be found in the stroma intervening between the gland-vesicles and the dilated excretory ducts, in the tissue which constitutes the walls of the hollow spaces, or the buds which project into their interior. This tissue, in the preparations that we have examined, has appeared sometimes with the characters of fibrous tissue, either completely formed or more frequently young, and abundantly supplied with cell elements; sometimes presenting in every particular the characteristics of sarcomata and myxomata when developed in any other part of the body.

We shall not insist upon the histological differences which separate these three varieties of pathological tissues. In certain cases some difficulty may be experienced in distinguishing them one from another; in tracing, for example, a well-marked line of demarcation between fibrous tissue in course of development and true sarcomatous tissue; besides, mixed forms will occur, in which there will be a mixture, often in unequal proportions, of sarcomatous and myxomatous places. The study of these questions belongs to the anatomical diagnosis of tumours in general.

The important point, if our way of understanding the mode of constitution of the tumours under consideration is correct, is that, each one presenting a common point of structure—the alteration of the gland-ducts, and each offering, on the contrary, a distinctive character—the mode of constitution of their stroma, it is evidently according to the nature of this last that they must be distinguished, and consequently named. In one word, they must be considered as *fibromata*, *sarcomata*, or *myxomata* of the breast, and not as more or less altered *adenomata*.

Nevertheless it does not seem to us to follow from the facts we are here stating that the notion of a concomitant glandular hypertrophy must be altogether discarded. Increase in the number of the *acini* is possible, and even probable. If on the one hand, indeed, the small proportion of the glandular element of the breast in that of a young woman, who has had no children, and especially of one

who has not suckled, be taken into account; and, on the other hand, the large number of dilated and altered *acini* met with in little fibrous tumours of the breast, developed under the same circumstances—one is forcibly led to admit that a process of hypertrophy in the gland itself has accompanied the formation of the neoplastic tissue in the intervening stroma. But, to repeat it once more, it is not in that alteration that the characteristic of the lesion must be looked for, because it is found with analogous characters in tumours of different kinds. In support of this view an argument may be adduced, already put forth by MM. Cornil et Ranvier in their "Manuel d'Histologie Pathologique," and drawn from the examination of tumours of this kind, returning after removal. The new tumour no longer contains gland-tissue; an evident proof that, in the primitive tumour, the glandular hypertrophy constituted a simply accessory element.

To sum up, if it is sought to give an account of the mode of general development of these tumours, it may be granted that there is formed in the interlobular tissue, following the same mechanism as in the connective or fibrous tissue in any other part of the body, a neoplastic tissue, which assumes, according to the case, the characters of a fibroma, a sarcoma, or a myxoma. At the same time, and probably on account of the irritation in the neighbourhood, the *acini* of the gland hypertrophy, increase in number and size; they are, so to speak, thrust into prominence (*etales*) and altered in form by the processes set agoing around them. The cavities limited by their walls constitute spaces perfectly available, where the newly-formed tissue tends to develop at ease in the form of buds and *papillæ* which project more and more into their interior. In this respect these tumours may be compared with those which develop in other cavities of the economy, and which generally show also a tendency to assume this budding and papillary form. We know, indeed, the frequency of papillary growths in the bladder, in the rectum, in the mucous membrane of the mouth, tongue, larynx, &c. Here too the anatomical form is similar in every case, as is indicated by the generic term *polypi*, under which the greater part of these cases have long been confounded. A more exact examination has since proved that, in cases of that kind, we may have to deal with tumours essentially different the one from the other.

Non-cancerous tumours of the breast generally present themselves under two leading forms. In the one, the tumour, generally small, is traversed by the narrow clefts we have described, but of true cystic cavities it presents few or none: in that case it turns out generally a fibroma of the breast, but occasionally also a sarcoma. This last fact explains the recurrence of tumours apparently benign, their growth becoming suddenly rapid, or yet again their pretended cancerous transformation. In a second form, cystic dilatations, often of considerable diameter, predominate (cysto-sarcomata); the tumour is usually large, it is accompanied sooner or later with ulceration, or rather perforation of the skin, through which a fleshy-looking granulation appears. These two forms are referable however to one fundamental type; they constitute a natural group of tumours, which, for the anatomist and the clinical worker (*clinicien*), deserve to be separated from cancer. Attentive observation of the stroma will also permit their being divided into a certain number of varieties, important to be distinguished from the double point of view of anatomical diagnosis and exact prognosis.

We have only had in view, in these observations, the *papillary* forms of the non-cancerous tumours of the breast, which are the most frequent. We know that they may assume another form, that of fibromata, sarcomata, and myxomata *en masse*. We have had no opportunity of observing them, and in regard to them we confine ourselves to this simple mention.— *Obstetrical Journal*, *April*, 1875, *p.* 2.

II.—THREE CASES OF ACUTE ARTICULAR RHEUMATISM PRESENTING ANOMALOUS SYMPTOMS, AND REQUIRING AN UNUSUAL COURSE OF TREATMENT.

By Dr. JAMES F. DUNCAN, President of the King and Queen's College of Physicians in Ireland, &c.

[All the three following cases, whilst they presented the ordinary features of acute rheumatism, had these peculiarities—marked pain and tenderness affecting some part of the spinal column and all absence of acid reaction of the urine.]

Case 1.—The urine was neutral in reaction with a considerable deposit of a white appearance which was taken to be phosphatic. There was no improvement in the case under the treatment adopted.

Feb. 14. The muriated tincture of iron was substituted in his mixture for the dilute muriatic acid. From this date there was a steady and marked improvement; he was nearly entirely free from pain and swelling of the joints on the 18th, but the urine continued to exhibit a neutral reaction until the 20th, when it resumed its normal acid character, which it retained afterwards as long as he was under treatment.

Feb. 23. There was some return of pain in the left elbow, but there was no swelling or redness of the joints. He was taking his iron mixture, but not regularly, and his pills of quinine and opium had been left off for some days; both remedies to be resumed.

Feb. 25. The pain had moved to his left shoulder; he had been guilty of indiscretion in his diet, which probably was the cause of the return.

The same treatment was continued; the pains were afterwards trifling in amount, his appetite increased, his general health improved, and he left the institution convalescent on the 12th March, 1875.

Case 2.—Mr. H. G., a clerk in the Bank of Ireland, was admitted to the Maison de Santé on the 19th February, 1875, labouring under acute rheumatism from the 13th of that month. He attributed his illness to having got his clothes wet when going to one of Moody and Sankey's meetings, and sitting in them for a couple of hours before his return home. He had been under treatment in his lodgings, under the care of a very respectable medical man, previous to his admission; he stated that the treatment employed for his relief was the exhibition of alkalies. His suffering was extreme, and it was with great difficulty he was carried upstairs to his room from the cab which conveyed him to the door. On testing his urine it was found neutral in its reaction; there was not much swelling of the affected joints, but there was acute pain, and there was considerable tenderness of the lower portion of the dorsal spine when the part was examined. Owing to the similarity of his condition and symptoms to that of Mr. L., the treatment which had been found beneficial in his case was immediately directed for Mr. G.—namely pills of quinine with opium and belladonna, one every third hour; diluted muriatic acid in a mixture, one drachm to eight ounces, an ounce every third hour; arnica paint to the painful parts, and the affected limbs to be swathed in French wadding, covered with oiled silk.

The next day, Feb. 20th, there was considerable improvement; the pulse had fallen to 84; the tenderness along the spinal column was diminished, pain was confined to the left knee, and the appetite was improved; only the urine remained neutral.

Feb. 21. The pain had left the left knee, but it had seized the right wrist. The urine was neutral, with a considerable brownish deposit through it; he had slept badly, but his appetite was good; the pupils were natural in appearance.

Feb. 22. Very much better in every way; had his medicines every second hour; urine neutral.

Feb. 23. Complained only of a slight pain in left elbow; pulse 72; urine neutral.

Feb. 25. Urine for the first time exhibited an acid reaction; he complained *only of a little pain in the right groin.*

March 1. Convalescent.

March 6. He had a return of his pains in right instep and knee, and behind his thigh. He had been allowed a little indulgence as to the use of grapes, oranges, and other articles of diet, which some friends supplied him with, and had exceeded the quantity permitted; this was probably the exciting cause. I ordered him a mixture containing calcined magnesia and colchicum, but the next day his pains returned with great severity; his appetite was defective, and his urine again exhibited a neutral reaction. He was then put upon the tincture of iron, with quinine in mixture, and his former pills were resumed.

March 8. The urine was this day acid; there was still some pain and tenderness over the lumbar vertebræ, but nothing to signify, and his general condition was much improved. As he was anxious to take advantage of a short leave of absence, which had been granted to him for the purpose of going to a friend's house in the country, he left the institution the next day. I have since seen him at his office perfectly free from all his ailments.

Case 3.—Mr. M., aged 23, admitted to Charlemont-street on the 8th of March, 1875, labouring under acute rheumatism. He stated that he took cold about three weeks previously, and that for the last week of the time he had been afflicted with pains in one or more joints of his body. I saw him on the 9th; at that time his right shoulder was principally affected; his pulse was 100 and feeble; a sour smell exhaled from his person; his urine was of a reddish colour, as if it contained blood, and the reaction was very faintly acid. He was ordered a diaphoretic mixture, with pills containing one grain of blue pill and half a grain each of opium and colchicum; one to be taken every third hour.

March 10. He was more feverish, eyes heavy; his pains had attacked the left side of his body; his tongue was moist and clean at the edges, but furred in the centre; his pulse was 108; the urine not so deep in colour, with the same faint acid reaction. He was ordered to stop the mercurial and opium pills, and to take others instead, containing one grain each of sulphate of quinine and opium, and one quarter grain extract belladonna every third hour, with lemonade for drink, continuing the wadding swathe.

March 13. He was rather better, tongue was cleaning at edges; pulse 100. He was still perspiring, but the urine, which was scanty, had now a neutral reaction. He was ordered to continue his pills, and to take the muriatic acid mixture, one drachm and a half in eight ounces; one table-spoonful every third hour.

March 14. He had taken only two ounces in all of his mixture, but he felt himself better. Slept well the previous night. His pulse was 96, but the urine was still neutral. He was directed to take a wineglassful of his medicine for a dose.

March 15. His pulse was 88. His tongue cleaner; the temperature of his body had fallen considerably; his perspiration was nearly gone; his pains were much easier, and he was able, for the first time, to sit up in bed with a bed-chair supporting him. His urine came more freely, and without inconvenience, but it was perfectly neutral.

March 16. His pulse was 80; tongue cleaner; urine still neutral. Pain relieved, confined to his left wrist, but it was more a stiffness than a pain. His bowels were opened yesterday by an aperient draught.

March 17. Pulse 80. Pains diminished; could move his arms with freedom; urine still distinctly neutral.

March 18. Urine acid for the first time. Pains have left his left shoulder, and have attacked slightly his right one; attributes the change to cold from exposure in the night. The dose of his mixture was reduced one half owing to the change in the condition of the urine.

March 19. Urine again exhibited a neutral reaction. There was perceptible some remains of the sour smell from his perspiration. His pains were considerably relieved, but traces of them were complained of in his left shoulder and right wrist. He was up yesterday. To resume his former dose of the acid, but not to do so until his bowels were moved by aperient pills, containing blue pill and comp. rhubarb pill.

March 20. Bowels were not moved ; has had none of his mixture in consequence. Pains are much worse ; right wrist swelled. To have an aperient draught and his mixture again, whether any action of the bowels followed or not.

March 22. Bowels were moved after the second dose of the medicine. The urine is again acid in its reaction; marked improvement in his condition: able to move his fingers and hands freely.

March 23. His pills were omitted yesterday. Had not so good a night. Complained of great pain over the sacrum; also of a slighter pain in right hip and left elbow; his arms and fingers were quite free. Medicine continued.

From this out his progress towards recovery was steady and satisfactory; the pain and tenderness over the sacrum disappeared on the 25th, and on the 29th he was discharged well.

At the time I resorted to the foregoing treatment I was not aware that any other practitioner had been led to adopt a similar course, and it was only after the present paper was drawn up that I found, on consulting some books of reference, that Dr. J. Russell Reynolds, in 1869, had published some cases in the British Medical Journal, in which he had used the muriated tincture of iron in large doses, with very decided benefit. In two of these the condition of the urine is stated to have been alkaline, but no information upon this point is given as to the state of that fluid in the remaining six. In fact he was induced to resort to this remedy, not from any theory as to its effect upon the renal secretion, but simply from analogy, because of the marked benefit derived from its use in erythema and erysipelas. It is quite possible that this medicine may have a wider range in its application in this disease than I am at present disposed to allow ; but I think the fact that we may have acute rheumatism in patients in whom the urine is not acid in its reaction is a point worthy of serious attention, and one which should lead medical practitioners carefully to examine its condition in all cases, and to shape their treatment accordingly. There can be no question that whatever part the administration of the hydrochloric acid played in the instances under review—for it is freely admitted that the adjuncts of the treatment may have had a good deal to do with the quickness of the termination—it certainly was productive of no injury; on the contrary, everything led me to believe that it really had a good deal to say to the relief of the patient, and that the larger the dose, and the shorter the interval in the administration, the more striking was the benefit. The dose Dr. Reynolds gave was 30 minims of the perchloride in the two first cases every sixth hour, and 40 minims in the remainder, and he states that the relief was most marked in its character, that the pain was lessened in one day in four cases, in two days in three, and in three days in one; the temperature was reduced with similar rapidity ; and he sums up by saying that there was an entire absence of discomfort from taking the medicine ; there was no headache ; the tongue cleaned; the feelings improved, and that the cases terminated favourably in all within the short period of fifteen days. I omit from this enumeration one of his cases which was complicated with cerebral symptoms, and in which the patient died comatose.

The progress of animal chemistry in modern times has so deeply ingrained, into our minds that the cause of acute rheumatism is the preternatural presence of lactic acid in the system, and that the proper antidote for this is the administration of some suitable alkali, that it requires, I am afraid, some effort on the part of my hearers to be convinced that there has not been some mistake committed here either in determining the nature of these cases, or observing the effects of the treatment; and I confess that, judging from my own feelings in the matter, incredulity under the circumstances appears not only pardonable but justifiable. If, however, the statement of facts as they have occurred shall have the effect of stimulating my brethren to a closer observation of facts, and to a more searching inquiry into the effects of remedies, good will be accomplished, whether the view here put forward be established or overthrown.—*Dublin Journal of Med. Science*, June, 1875, p. 502.

DISEASES OF THE NERVOUS SYSTEM.

12.—NITRITE OF AMYL IN FACIAL NEURALGIA.

By Dr. GEORGE H. EVANS, Assistant Physician to the Middlesex Hospital.

Finding that one of the uses of nitrite of amyl does not seem to be as generally known among the medical profession as it should be, I think it may be worth while to put on record the few cases of this use of the drug that have come under my notice.

It occurred to me about three years since, on first becoming acquainted with the effect of inhalation of nitrite of amyl, which was then said to flush the small vessels (first of the face and then of the trunk) by paralysing the vaso-motors, but which at all events caused flushing of the face, &c., that it might possibly give relief in some of those cases of facial neuralgia which are obviously connected with, if not dependent on, anæmia. A case occurred which gave me an opportunity of testing this. A girl applied at St. Thomas's Hospital one Thursday morning about 11 a.m., trying to get some relief for neuralgia, which had prevented her (she said) from sleeping since the previous Saturday. She was evidently in considerable pain, and markedly anæmic. Hoping for a possible immediate effect, I made her inhale some nitrite of amyl. It took rather a longer inhalation than I expected to produce the usual flush: however, it came, and she then said that she felt a throbbing and a beating in her head, but that the pain was subsiding. In a very few minutes she said the pain had left her. I was very doubtful about the amyl producing anything more than simply temporary relief, so I told her to come again if the pain recurred. She did not come again to me; but she attended Dr. John Harley (she was already an out-patient under him) on the Saturday, and said she had had no pain since the inhalation. I did not see her again.

The next case in which I used it for this purpose was that of an anæmic young woman who was in St. Thomas's Hospital with acute rheumatism, and who during her convalescence suffered much from facial neuralgia, which she said had tormented her since childhood. On her the inhalation of amyl did not produce quite so striking an effect as on the former patient; but it invariably gave her relief, so much so that she said: "I wish you would let me take that little bottle out with me; I have tried all sorts of things, and never found anything do me so much good as that."

The third case I have to mention is that of a young lady who was, in September last, suffering from very severe neuralgia, whom I knew to be generally anæmic and whom I noticed to be much more anæmic than usual at that time. She told me she was always paler when these attacks came on. I gave her some amyl to inhale: it was some time before it produced any effect, visible or otherwise; but as soon as it had produced a slight flush, she said the pain was relieved. I saw her three weeks later, and she told me that she always prevented the attacks of neuralgia by inhaling amyl when she felt they were coming on. One of her sisters, who was not anæmic, incautiously one day sniffed at the amyl bottle, probably because I had especially cautioned my patient against allowing any of her sisters to use it; and immediately her face became most painfully flushed, and she felt sufficiently uncomfortable to prevent her repeating the experiment. I think, from what I have seen of its use, that anæmic people (as one might expect) can bear very much larger doses of nitrite of amyl than those who are not anæmic.—*Practitioner, Sept.* 1875, *p.* 179.

.—ON GELSEMINUM SEMPERVIRENS IN THE TREATMENT OF ODONTALGIA.

By Dr. JAMES SAWYER, Physician to the Queen's and Children's Hospitals, Birmingham.

I desire to record my testimony in favour of gelseminum as a remedy for lontalgia. The drug is not very generally known to English practitioners, though it has been long in use in America.

Gelseminum sempervirens, the yellow jasmin, or woodbine, belonging to ıe natural family *Apocynaceæ*, grows plentifully in the Southern States of lorth America. The root, the part used in medicine, is sent to England ut up into small pieces, and these are of a brownish colour externally, of a reyish colour on section, from half an inch to two inches in length, and about quarter of an inch in thickness. Several fatal cases of poisoning by gelseminum have been recorded. Death seems to have arisen from asphyxia, esulting from paralysis of the respiratory muscles. The drug appears to act nainly upon the nervous system, impairing the sensibility of the sensory ierves.

The dose of the powder of the root is from one to two grains. I have always used a tincture prepared according to the following formula, for which I am indebted to Mr. Dewson of this town:—Take of gelsemin root, in coarse powder, two ounces; of rectified spirit twenty fluid ounces. Moisten the powdered root with ten ounces of the spirit, and allow the mixture to stand for twenty-four hours. At the end of that time pack in a percolator, and add the remaining ten ounces of spirit. When the fluid has ceased to flow, remove the contents of the percolator and press them. Add the pressed liquid to that obtained by percolation, filter, and make up with rectified spirit to a pint. Eleven minims of the tincture are equal to about one grain of the root. The tincture contains only a trace of tannin, and may be given with any of the preparations of iron.

I have rarely found gelseminum fail to give decided and lasting relief in cases of neuralgic pains in the face and jaws, associated with carious teeth. I have usually given fifteen minims of the tincture every six hours.—*Practitioner*, *August*, 1875, *p.* 115.

14.—ON SOME CASES OF SYPHILITIC NERVOUS DISEASE.

By Dr. J. DRESCHFELD, Lecturer on Pathology, Owens College; Assistant Physician, Manchester Royal Infirmary.

Amongst the affections of the nervous system, those due to syphilitic lesions are certainly the most interesting, as well from a clinical as from a therapeutic point of view; for while on the one hand the lesions occurring in the different parts of the nervous system give rise to the most varied symptoms, an antisyphilitic treatment, on the other hand, is in most cases, especially where the specific lesion has not in its turn caused irreparable secondary degenerations in the nervous substance, followed by the happiest results. Though the more exact study of these diseases dates not many years back, the number of well-observed cases on record has already reached several hundreds; a perusal of the different treatises, such as those of Hughlings Jackson, Buzzard, Broadbent, Wilks, and others, will however show that many cases, before they came under these observers, had been allowed to run on for a long time without being recognised, and without any specific treatment being attempted; one chief reason perhaps being the now well-established fact, that where the syphilitic poison selects as habitat the nervous system, we have often few, if any, secondary symptoms. As a small contribution, therefore, to this very important and highly interesting chapter, I beg to give an account of several cases observed by me, which particularly illustrate the varying of the symptoms according to the seat of the lesion.

Case 1.—*Emma H., aged 28, single*, domestic servant, was sent to the In-

firmary as an urgent case of brain fever, and admitted under my care (in the absence of Dr. W. Roberts) on April 22, 1874. I saw the patient on the morning following. Without being comatose, the patient was apathetic and taciturn, complaining only of a great pain at the back of the head. From her mistress, who had accompanied her to the hospital, we gathered that she had complained for a fortnight of great pain in the head; this was accompanied by a weakness in her right arm and leg, which increased to such an extent that she was obliged to take to her bed four days before admission; the day before admission the headache got much worse, vomiting came on, and she felt so prostrate that the family medical adviser sent her to the hospital.

The patient is of middle height, dark complexioned, and of sallow hue; her skin hot and perspiring freely; temp. 101·5°, pulse 110, resp. 24 per minute. No nodes on any part of head or body; no rash or cicatrices on the body; the pupils a little dilated, equal and reacting to light; hearing good; speech has nasal character, as if some defect in palate; no paralysis of the oculo-motor muscles; no facial paralysis; tongue put out straight, moist, covered with a thin fur. Bowels had acted several times during the night (patient had received a saline mixture on admission). Urine high-coloured, sp. gr. 1022, no albumen, abundant phosphatic deposit. Physical examination of chest and abdomen reveals nothing abnormal. Spine not tender on pressure; the right arm and right leg completely paralysed. No wasting of right side. Sensibility on right side intact, likewise electro-contractility and electro-sensibility, and sensibility to pain and to temperature. The left arm and leg in no way affected. Total loss of appetite; great thirst.

The age of the patient, and the hemiplegia preceding the purely inflammatory symptoms of the meninges, made me at once suspect a specific cause, and I prescribed 10 grs. of pot. iod. pro dos., together with cold applications to head.

April 23, Evening. Patient in about the same condition. Pulse 112, temp. 100·8°.

April 24, Morning. Patient passed a very bad night. She had been very restless, tossing about in bed, and delirious; complains of most violent pains in head; pulse 100, temp. 101°. Mr. Windsor kindly examined the eyes, and found the fundus normal. On examining the throat, the soft palate is found to be altogether absent, likewise the right tonsil. The pot. iod. was increased to 20 grs. pro dos., pil. Plummeri (gr. v.), one every two hours.

Evening. Patient worse; semi-comatose; passes fæces and urine involuntarily; twitchings of muscles of left side; pulse thin, 108; temp. 101·6°; resp. hurried and shallow. Treatment continued; mercurial inunction applied to both legs.

April 25. Patient considerably better; her features present a more cheerful aspect; has no recollection of what happened during the last twenty-four hours; pulse 100, temp. 99·6°. Is able to use her right arm and leg a little; pain in head less severe; complains of pain in throat; paralysis of the sphincters continues. Treatment continued; chlorate of potash gargle. Patient is now for the first time able to give her history. Has enjoyed good health, till twelve months ago she suffered from headache, rash, and sore throat, the throat continuing to remain sore for several months; for the last two months suffered from pain in the head, which was worse at night; a fortnight ago began to lose power in right leg and arm, which increased till that side was rendered perfectly useless.

April 26. Improvement continues; temp. 98·6°, pulse 80; has now control over the sphincters.

The headache and hemiplegia from this time improved rapidly; she continued to take the pot. iod. and the mercury, and the induced current was applied to the right leg and arm. She was sent to the Convalescent Hospital on May 16, preserving as the only remains of her illness a slight dragging of right leg; she stopped for three weeks at the Convalescent Hospital, when she left, the dragging of right leg still persisted, and I have heard *nothing further from* her since.

There can be no doubt that we had to do here with a case of syphilitic meningitis; the case, however, is instructive in several respects. The syphilitic disease ran its course in a very short time, and within twelve months from the first appearance of the secondary symtoms we witnessed the destruction of the soft palate and the right tonsil, and the advent of the graver nervous lesions, which began with intense headache and right hemiplegia. As regards the nature and seat of lesion, it is more than probable (from the fact that the nervous troubles came on soon after the syphilitic infection, that the symptoms were ushered in by great headache, that the development and disappearance of the symptoms were very rapid, and that the other symptoms pointing to a gummatous tumour of the brain were absent) that we had here at first a diffuse inflammatory disease in a cranial bone of the left base, which by its compression of the right motor tract gave rise to the hemiplegia, and which by its extension to the coverings of the brain brought on the general meningitis. A peculiarity which is noticeable in this case is the relation of the pulse and temperature to the general symptoms, the temperature being much lower and the pulse showing besides a greater constancy than is found in simple meningitis. In a case somewhat similar, but much slighter, quoted by Poncet (Annales de Dermatologie et de Syphilographie, 4^{me} année, No. 3), the temperature ranged between 98 and 99·7°, and the pulse never exceeded 92. Should this be found constantly we should have another important aid in distinguishing syphilitic from simple meningitis. The paralysis of the sphincters marked the gravity of the case (in the lighter forms of cerebral syphilis, constipation and slight retention of urine are generally observed); for, as in all other nervous affections, they occur in syphilitic nervous diseases in the last stage, and out of twenty-five cases, which I collected from different authors, where there was such a condition of things, sixteen terminated fatally.

If for a moment we consider the different aids we have in diagnosing the syphilitic nature of a nervous disease, we have the following:—

1. Age of patient. The age of persons affected with syphilitic nervous disease ranges between 25 and 40; out of ninety-six cases collected by Braus, sixty were of patients between 20 and 40 years old; and the cases given by Broadbent, Buzzard, and others exhibit the same proportions.

2. A syphilitic history. We have here to bear in mind that it is often difficult, especially in women, to trace such a history; that often when the syphilitic virus selects for its locality the nervous system, there are few, if any, secondary symptoms; while, on the other hand, nervous troubles coming on in a syphilitic patient may be simply due to a coincidence. On looking over many recorded cases, I find that certain forms of syphilitic nervous disease are much oftener preceded by well-marked secondary symptoms than others: this, for instance, is true for syphilitic epilepsy and the more acute cases of meningitis which come on soon after infection.

3. Multiplicity of lesion. Nervous symptoms which can only be accounted for by the assumption of separate pathological products situated in different parts of the nervous system are almost always due to syphilis.

4. Absence of other causes. This applies particularly to the paralysis of the different cranial nerves, and to sudden attacks of hemiplegia in young persons, in the absence of any cardiac or renal troubles.

5. Influence of antisyphilitic treatment. In a great many cases, especially where the course of the nervous disease is acute, and where the patient has not previously undergone an antisyphilitic treatment, the effects of the iodide and the mercury are very marked. In the more chronic cases, however, where the syphilitic deposit has itself undergone degenerative changes, and has established secondary changes in the surrounding nerve-matter, the treatment will of necessity be of little avail.

Having diagnosed a nervous lesion to be syphilitic, it becomes then of some moment to determine the exact nature and seat of the affection. This, though important as regards the prognosis of the case, is of no great weight as regards the treatment. I hope, however, at a future period to refer to this point also.—*Practitioner, May*, 1875, *p.* 343.

15.—TREATMENT OF CHOREA BY ARSENIC.

By George Gaskoin, Esq., Surgeon to the British Hospital for Skin Diseases.

Perceiving a renewed attention bestowed on the treatment of chorea by means of arsenical preparations, I would add a few words to a subject which is only slightly referred to in my recent work on Psoriasis. How is it to be explained that this remedy, which has been pronounced to be infallible, or nearly so, by very competent physicians, should now hold scarce a second place? This I attribute to the faltering and confused recommendations found in medical works, or rather, in educational works on medicine, which results in a mixed treatment being adopted for chorea—a sort of compromise between opposite extremes. We are not even yet emancipated from the exaggerations of Hamilton as to the efficacy of purgatives in the treatment of chorea, as found in his work on Purgatives, or from the effect of the still more extraordinary statements of Parr in the beginning of the century, as seen in his Medical Dictionary. At the very least, the modern treatment is begun by purges, which are generally so thorough as to add both to the intensity of the disorder and to the difficulty of its cure; and, besides this, the course of arsenic will be more than once interrupted to give another purge to the patient, which only serves to aggravate the complaint in its general features. True, we consider it one of debility; but, in the works referred to, we are not warned against increasing that debility, even if the chorea have occurred after wasting fevers, such as I have sometimes seen it accompanied by eczema. In a letter which I have before me from Mr. Hammond, of Whetstone, who had great reputation thirty or forty years since for the cure of chorea by arsenic, he is very explicit on this point. "The health has need to be well supported. A full diet of meat and two glasses of port wine should be given daily; the latter with water, if the subject be feeble or excitable. An egg should be taken for breakfast, and all trash in diet avoided; that is, all that adds to the labour of digestion without contributing to support. The only purgative ever employed should be rhubarb or the compound decoction of aloes; but only to regulate the bowels, never to purge. The health should be sustained by air and exercise, and diet only modified by the absence or presence of plethora. With menstrual irregularity, riding on horseback will be useful, and air as much as possible, but not to the point of fatigue." Again, he says:—"The mineral solution of arsenic is the strongest tonic known; it often subdues ague when quinine has failed. My reputation in the cure of chorea rests wholly on the use of this preparation. I give it in that dose (nine drops three times a day), beginning with four, and gradually, in ten days, getting to nine. I have never known the remedy to fail; at least be assured that few cases of chorea will resist this treatment. If it disagree or headache be felt, lower the dose one drop."

These are the *ipsissima verba magistri* never published before. They have lain by neglected for many years, and their resuscitation at the present moment appears to me opportune. The preparation is that adopted into the London Pharmacopœia, as the liquor arsenici chloridi. In the British Pharmacopœia, there is a modification of its strength. It is no other than De Valangin's mineral solvent. The directions given are for the treatment of young people; but the difference of the Pharmacopœia must be allowed for.

I consider the comments of Dr. Eustace Smith and Dr. Spender, in recent numbers of the Journal, to be valuable accessions to science, and I should not fear to adopt that treatment, using the precaution to see my patient every day. But I deem it safer to begin with the smaller dose and rapidly to increase it, so as to be on my guard against idiosyncrasy. There is much in the behaviour of arsenic that leads me to think that its operation as a therapeutic agent is directly or essentially on the nervous system. I have found it more than usually efficacious in cases of skin-disease which are complicated with nervous phenomena. For instance, I have recently had a case of extremely localised erythema, affecting part of the hand on its dorsal surface, *and always recurring on* the same spot. Whenever the patient has come *under my treatment, the skin*-affection has been controlled by arsenic in quite

a remarkable manner. She is, besides, very much the subject of epilepsy. In scarce any other case of eczema have I met with such immediate success, and the patient is correspondingly grateful to one she calls her thirteenth doctor. —*British Medical Journal, June* 5, 1875, *p.* 747.

16.—ON THE RATIONAL TREATMENT OF SOME FORMS OF HEMIPLEGIA.

By Dr. ALFRED CARPENTER, Croydon.

[Cases of hemiplegia are occasionally but perhaps rarely met with in which recovery takes place, in a manner to contradict the unfavourable prognosis which all ordinary experience warrants. Dr. Carpenter has notes of ten such cases, and the following paper, which was read before the Medical Society of London, is founded upon them.]

Dr. Wilks remarks, in one of his telling lectures upon apoplexy, that of the disease which is sometimes called serous apoplexy he knows nothing; and in another lecture he says "he is occasionally called to a patient insensible or suffering from apoplexy, and on examining the brain he found no evidence of hemorrhage, yet he had no doubt that death did proceed from the brain, the post-mortem appearance being the same as in patients who had really died with clots in the cerebrum."

Now, it appears to me that these are the cases which practitioners like myself meet with more often than those whose work is mainly limited to consulting practice. Dr. Hughlings Jackson says of (so-called) serous apoplexy that it is a term used to designate those cases of speedy death with coma when no blood can be discovered effused in the brain; and he declines to adopt the term, inferring that it is an incorrect one.

Trousseau, on the other hand, thinks that the phenomena whch are ascribed to congestion, and which lead to death without producing clot, are due to what he calls cerebral surprise.

It appears to me that some of these cases, not being immediately fatal, are just the cases with which I hope to interest the Society; and without intending to suggest that the term serous apoplexy is a correct one, I may fairly assume that cases do occur, in which no cerebral rupture is discovered after death, and no absolute reason appears to be present why the patient should have died. There is interference with circulation through brain substance sufficient to produce coma and paralysis: sometimes such cases do not die, the patient gradually recovers from his coma: hemiplegia remains for a time, but it ultimately yields to rational treatment. The rules of prognosis which are laid down in some of our guide-books are not always safe rules to follow, for they ignore this class of cases, and lead us to give a much more serious aspect to every case of the kind than it may possibly require.

Thus, correspondingly, I used to be taught that double pneumonia was almost necessarily a fatal disease, and so it appeared to be in hospital practice; but, in point of fact, among well-to-do people, among those who have more blood to spare than they want, it is found, when detected early, and treated by absolute rest and a few simple rules, to be as easily cured as a simple catarrh; and if I am not altogether wrong, the same simplicity is only required in the treatment of some of the dangerous forms of paralysis which are often preceded by complete coma.

Before considering what the principles of treatment should be, I will detail a typical case. A man aged fifty-six has for some time a continuous state of malaise and discomfort, with an increasing feeling of weakness and an inaptitude for either mental or muscular work. For this he takes more stimulant than usual to keep him up to the mark. "Pick me up" is a favourite expression when taking his dram. The patient is off his appetite; he eats but little, and that little *must be rich and uncommon*: he requires to have his appetite *tempted. Then he has a sudden attack* of giddiness, becomes faint, either

falls or quietly lapses into a state of unconsciousness for a time; sometimes he is convulsed. On recovery from his comatose or semi-comatose state, it is found that one side is weak; it then becomes gradually paralysed, speech is affected, the mouth is distorted, and there is more or less perfect hemiplegia, both sensation and motion being altogether lost, or motion alone being interfered with. After a time sensation returns; speech comes back; but the angles of the mouth sometimes remain slightly drawn down, but not always to the side affected. In two cases I have met with recurring convulsion without loss of consciousness, but with perfect hemiplegia, which has continued at intervals for a considerable time, and yet there has been ultimate recovery. If the patient is to recover from the shock or surprise, the hemiplegic symptoms gradually decrease and at length altogether disappear; the unfavourable signs pass away in a year or two, and if a proper course is followed they need not recur. In all the cases I have met with there has been a general swelling of the paralysed limbs. This œdema has come on within two or three weeks after the first attack, the skin then becomes tender, and in one or two cases there appeared to be a tendency to that muscular rigidity which is said to indicate that the cerebral lesion has reached the stage which has been described as red softening—a condition such as generally follows upon the formation of a clot of blood effused in the substance of the brain from absolute rupture of cerebral vessels; the effused blood lacerating the nerve-tissue in its vicinity, and inflammatory action following as a natural sequence. When called to a case of the kind in question, the first great object of the attendant should be to prevent the rupture of the cerebral vessels, which may or may not have occurred. I believe that this prevention is more frequently possible among the well-to-do and wealthy classes than is usually supposed. The entire removal of the threatening symptoms which I have detailed, without leaving any evidence of organic damage behind, certainly proves that such symptoms may exist without being necessarily dependent upon absolute rupture. That death takes place in similar cases without rupture is known to most of us and proved by the quotations from the writings of the eminent authors I have named. I think in many cases the absolute break-down takes place after the symptoms have developed, and that cerebral hemorrhage or sanguineous apoplexy is not an antecedent so often as is supposed, but is the consequent of continued impediment to circulation after the coma has appeared.

In such cases, whenever doubtful as to whether hemorrhage has taken place, our exertions should be directed to the arrest of the congestive stage which supervenes upon that which causes the first symptoms. These in all cases depend in the first instance upon an anæmic condition of some portion of the cerebral organs, and which anæmia preceded the active development of the attack. This condition of anæmia probably precedes the acute attack in all these cases. In the majority of those which I have met with in which absolute recovery has taken place, I have come to the conclusion that they were due to a condition of blood allied to that which attends the gouty diathesis: that there is a condition of the system which may be fairly styled as that of suppressed gout, and that if the cerebral organs could be examined without injury to life, a condition of capillaries would be found somewhat similar to that which exists in those swellings which suddenly arise in the areolar tissue of persons subject to atonic gout; these swellings, tender at first, then become œdematous, afterwards gradually melt away. A somewhat similar condition is seen in an ordinary chilblain, which, however, goes away without leaving so much œdema as attends upon the gouty thrombosis. These swellings are assumed to be caused by capillary plugging; whether rightly so or not I am not able to state, not having an opportunity of inspecting any case *post mortem*, and not being able to find any description of them in any pathological work to which I have access.

It is generally the custom as soon as the patient begins to recover to talk about his debility. If he does not impress this view of the case upon his medical attendant, his friends do. Then comes the great error of treatment. *The necessity of keeping* him up is insisted on: so many glasses of wine, so *much animal food, so much* tonic, until at length the gouty condition, or at

least the condition allied to that form of disease, reasserts its sway, and the paient goes down agan. It is argued that the force of the circulation must be kept up to the mark, that the heart is weak, and strength must be got up by piling more work on to an already weakened organ. In this plan of treatment I am sure we are wrong. Common sense appears to tell us that the circulation having to pass through damaged tubes must not be pressed, that it is important not to put extra pressure upon an already damaged hydraulic machine, and that if we increase action in the circulation by pressing more matter into it, we shall only be adding fuel to fire. Our efforts should rather be directed first to the removal from the blood of those elements of debased and used-up organic matter which represent used-up tissue, and which from some cause or other have not yet been carted out of the system through the proper excretory organs. These we should get removed as quickly as possible. At the same time we should take off pressure from the vessels themselves, and so lessen the chance of rupture in the now bloated tissue of the brain.

In most of the cases which I have met with the patient had been living before the attack at high pressure, both of mind and body, in some of the cases also trying to enjoy the pleasures of life at the same time, or, as it is called sometimes, "burning the candle at both ends." There is a commencing decay of cerebral tissue, inasmuch as the lining membrane of some of the capillaries of the brain is becoming the seat of the morbid changes, probably of fatty degeneration or so-called atheromatous deposit, not, however, sufficient to allow of rupture unless pressure is put upon it, and not yet fairly discernible to the naked eye.

If we ask ourselves what it is that nature does require to alter the cause, we get a clue to rational treatment. There is in such cases hyperæmia of the body generally, whilst a portion of the brain tissue is anæmic. We do not want more red blood, and there is access of fatty matter already in the fluids of the body. Our patient can afford to live upon his own excess of heat-producing material for a time, whilst measures are taken for the more perfect purification of his blood. If in the case in question there is no evidence of damaged kidney, if the first manifestation of the tendency to capillary disease has been cerebral, if absolute rupture of the central capillary or other portion of the brain circulation has not taken place, there may be great hopes of perfect recovery, if at the same time the ordinary temperature keeps near to a natural standard, and especially if muscular rigidity does not come on. I have met with two cases of recovery in which there has been a general state of anæmia instead of the usual hyperæmic condition of system which is usually present. In these I gave ammonia with assafœtida as the most useful stimulant, in the form of spir. ammon. fœtid. of the London Pharmacopœia; but in the hyperæmic cases I reduced the administration of stimulant to the smallest possible quantity.

Whilst carefully providing that the patient should breathe air as pure as possible, and admitted into the room directly from without, I have taken care that the room is warmed and that the body of the patient is kept warm, so that no loss of power should arise from the abstraction of heat from the general system; and that the quantity of food which might be wanted to keep up the animal temperature should be as small as possible, and thus the stomach should have as much rest as can be given to it. The great reason for this care is the fact that the patient cannot take exercise, cannot do any muscular work; the oxidation of fat and other hydrocarbons which exist in excess in all those who are the subjects of this disease cannot be properly consumed. This defect has helped to produce the condition under which the patient is suffering, whilst from the same cause there is very little opportunity of getting rid of the carbonic acid which is the result of these internal fires upon which animal heat mainly depends. There is a tendency therefore for the fire to be extinguished by its own débris. Whilst taking care therefore that the oxygen provided for the use of the patient is not depreciated, external warmth to the body generally will assist in limiting the necessity for fresh fuel in *the shape of highly* nitrogenised food and fatty matter. *If the débris which is the result of* a production of animal heat is not

removed, fatty degeneration or some other defective state of tissue is sure to arise both in muscle and nerve. As soon as the tenderness in the skin which generally supervenes after recovery from the shock has departed, I have had the muscles of the extremities exercised by the aid of an attendant quietly and gently kneading the various sets of muscles in the hands for at least two hours every day; the muscles upon the forearm or the calf of the leg being grasped firmly by the hand and much of the blood squeezed out of them. Then the limb is flexed or extended so that each set of muscles are taken in rotation as long as the patient can bear it. I thus get regular exercise of the muscles, and by emptying out the blood from them the absorbents and the veins are pressed into action to remove such débris as would, if it remained there, produce evil: which would have remained in the system if the muscles were left in that state of repose which this class of patients are supposed to be obliged to endure. This kind of exercise produces an increase in the given number of inspirations per minute, so that it is fair to assume that there is an increased formation of carbonic acid in the periphery of the system, and that this débris finds its way out through the pulmonary organs more perfectly than it otherwise would do if the muscles were not exercised.

At the same time I have encouraged the excretory organs by providing an excess of diluting liquid, making the patient take as much water as can conveniently be done, giving it in a medicated state, with phosphate of soda, Pullna water, or small doses of sulphate of magnesia, acidulated with an excess of acid, as an aperient, every morning, according to the indications suggested by a frequent examination of the urine; also occasionally using a few doses of digitalis wherever there has been a full pulse with increased frequency of heat.

Lastly, as regards food. If there is one thing which experience establishes more than another in the dietetics of cerebral disease, it is that patients having a cerebral lesion can get on a very long time without azotised or carbonaceous food, provided a sufficient quantity of water and pure air is given, —that nature, under the circumstances which attend upon coma or cerebral congestion of any kind, renders the requirements of food of the most limited character. In the cases I am considering, it will be found most beneficial to limit the supply of all the highly nitrogenised articles of food; to forbid the use of beef, pork, veal, altogether; to allow but little fat, and not much sugar; forbidding all rich made dishes and heavy pastry; limiting the meal to two courses only, and giving claret or some other light wine freely diluted with water in preference to a vintage which has had an incomplete fermentation and also contains a large percentage of superadded spirit. In all the successful cases I have met with, the daily diet has been fish at least once, sometimes three times daily, occasionally a little mutton, chicken, or game, with simple milk or farinaceous pudding. If the skin has had a tendency to dryness, I have given weak tea with plenty of milk; if there is a fairly acting skin, coffee has been allowed. If the skin has been dry, and the heart sensitive, I have found that tea does not digest well, and in such cases cocoa nibs will suit better. In the earlier stages of the disease the food has been such as a child a year old might take. As the patient progresses, his appetite returns and becomes at times almost ravenous; notwithstanding that, I have only allowed such food as could not produce evil from its indigestible qualities. Mutton broth, milk, rice-pudding, and the various farinaceous dishes which a good cook can always alter, will be found most certain to lead to a good recovery, and if the patient is hungry he can eat these; but if the appetite of the patient is to be considered, if the causes are again allowed to come into operation which produced the gouty state in the first instance, it is scarcely likely that future attacks will be warded off.—*Practitioner, May* 1875, *p.* 321.

17.—DETAILS OF ELECTRICAL EXAMINATION AND TREATMENT IN A CASE OF PERIPHERAL PARALYSIS OF THE FACIAL AND OCULO-MOTOR NERVES.

By Dr. Thomas Buzzard, Physician to the National Hospital for the Paralysed and Epileptic.

How far the application of electricity is available in paralysis of the external muscles of the eyeball is a point upon which some doubt is still entertained. In the case which is here related an unusual method of applying voltaism to these muscles was employed with success. Incidentally various points of great interest in reference to diagnosis as well as treatment arose in the course of the patient's illness, and the value of electrical tests was shown no less strikingly than the useful effects of voltaism in bringing back paralysed muscles to the influence of the will.

I was called in December, 1872, into the country by Dr. Playne, of Maidenhead, to see a gentleman sixty-two years of age, under the following circumstances:—The patient looked somewhat older than his age, and had been more or less ailing for some years. A year previously he had suffered from some obscure mental symptoms, which had followed prolonged sleeplessness. He was usually dyspeptic, and had experienced pains of rheumatic character. On December 13th he found in the morning that on cleaning his teeth the water ran out of the right side of his mouth, and his face was observed to be drawn over to the left. Next day he could not close his right eye. When I saw him on December 17th, there was pronounced paralysis of the right portio dura. There was complete inability to close the right eye; the angle of the mouth dropped on the right side; in smiling the face was drawn over to the left; and when asked to show his teeth, the lips were scarcely separated on the right side, whilst on the left the teeth were exposed in the usual manner. The aperture of the mouth, under these circumstances, formed an irregular triangle with its base disposed vertically on the left side. The right eye was painful, and watering from exposure. If there was any impairment of sensibility to touch over the right side of the face it was very slight indeed. When the conjunctiva of the right eye was touched with the finger-point, avoiding the margin of the lid, although the pressure was perfectly well felt, there was no reflex closure of the lids.

Here, then, were the ordinary symptoms of a peripheral paralysis of the portio dura, and the fact that the patient had been out in his garden on the evening before his attack rather later than usual, and that the weather was cold and damp, combined towards the probability of his suffering from a rheumatic affection of the nerve, or at least from a condition referable to the influence of cold.

I had the opportunity of applying electrical tests. I found that neither faradaism nor the interrupted voltaic current would excite the right facial *nerve*. As regards the facial *muscles* of the right side there was no reaction to the strongest faradaic current which could be borne, but when I applied to them the rheophores connected with a Stöhrer's constant battery, using four cells only, and slowly intermitting the current, I obtained marked contraction of those situated about the angle of the mouth. A similar power applied in like manner to the muscles of the sound side of the face produced no reaction. The sensibility of the skin of the face was decidedly lowered on the right side, especially below the eye, both to touch and to the pain of faradaism. The latter fact was peculiarly well marked. The grasp of both hands was weak, but not definitely unequal, and the patient could raise either leg against pressure equally well. There was no marked impairment of sensibility in his hands, but on inquiry he said that there was slight numbness of the finger-points on both sides. There was no diminution in the power of tasting on the right side of the tongue. There was not then, and there had never been, any weakness in the external rectus muscle of the right eye. I examined the urine, which was pale, clear, acid, and of specific gravity 1013. It contained *no trace of sugar nor of albumen*. There was general derangement *of the digestive functions*, with a furred tongue and some diarrhœa.

The patient was ordered a quarter of a grain of nitrate of silver, with one-fifth of a grain of opium, twice a day, and an effervescing mixture of citrate of potash and soda, with grain doses of iodide of potassium.

As regards the diagnosis, I thought there were sufficient grounds for believing that the lesion lay in some part of the course of the portio dura. Had it been at the deep origin of the nerve, it was unlikely that the sixth nerve, which (according to Lockhart Clarke) arises from the same nucleus as the facial in the floor of the fourth ventricle, would have remained unaffected. Moreover, and this was the most important feature, the electric reaction was distinctly that indicating peripheral paralysis. When the facial nerve is paralysed from central disease, it is, according to my experience, always the case that the facial muscles retain, either entirely or in great part, their power of being excited by faradaism. On the other hand, the absence of excitability by faradaism and the exaggerated influence of interrupted voltaism were completely characteristic of facial paralysis *à frigore*. I advised, and it was agreed, that treatment by interrupted voltaism should be employed.

On the 7th March, then, nearly three months after the seizure, this treatment was commenced, and afterwards continued almost daily for three weeks. Stöhrer's constant current battery was employed, at first four cells being engaged, then six, and finally eight. One rheophore was placed on the cheek at the point where the facial nerve breaks into its two great divisions, and the other at various parts of the face ; but especially often near the ala of the nostril. The current thus employed caused vigorous contractions of many muscles affecting the nostril and mouth. At other times one rheophore was applied near the outer canthus, and then the current caused contractions of the orbicularis palpebrarum muscle. Each sitting occupied about twenty minutes. One rheophore was lifted and reapplied at tolerably regular intervals of about 30 or 40 in the minute. During the first week the change effected by this treatment, although at once apparent, was not very marked ; but afterwards improvement was noticed daily. On March 28th, when the patient returned into the country, the cheek no longer bagged; the lower lip kept closed, instead of falling and showing, as it had done, the lining membrane, over which saliva trickled; the eye could be very nearly closed. Nor was this improvement altogether the result of a secondary contraction equivalent to that so often seen in the paralysed muscles in a case of hemiplegia, for a very considerable power of moving the mouth by voluntary effort returned. The nerve-twigs to the occipito-frontalis muscle must, I think, have escaped injury. At all events, when I tested the frontal part of this muscle a few days after beginning the treatment described, I found that it responded readily to the faradaic current when one rheophore was placed over the emergence of the portio dura and the other on the muscle. It was also capable of being contracted by voluntary effort. Nearly two years had elapsed when I was again on May 28th, 1875, summoned to see this patient. I found him in his bedroom, sitting up, with his back to the light, which his left eye was quite unable to tolerate. So much photophobia was there that I had to refrain from turning his face to the window whilst I examined him. The left eye was closed by ptosis of the upper lid, but the patient could, by a strong voluntary effort, open it, though the lid immediately afterwards fell. There was intense pain, referred to the ball of the eye, and also pain, together with tenderness on pressure, upon the left parietal bone, near its junction with the frontal. He had double vision, the images being crossed—that to his right belonging to his left eye. In order to avoid the confusion and giddiness caused by this diplopia, he was wearing a shade over the left eye. I found that there was partial paralysis of the branches of the left oculo-motor nerve, going to the levator palpebræ superioris, the internal, superior, and inferior rectus muscles. It seemed that the patient had been exposed to a great deal of domestic trouble and anxiety, with the result that his appetite and digestion had failed, and a few days before I saw him he had complained of double vision. It appeared also that several decayed teeth, which had been troubling him for some time, had interfered with his power of taking sufficient nourishment. I advised some chloride of ammonium, which seemed to have a good result as far as the pain in the eyeball was concerned. A fort-

night later, however, I found that whilst he had ceased to feel pain in the globe of the eye, the paralysis of the muscles before referred to as partial had become complete. There was complete ptosis, and absolute inability to turn the left eye either upwards, downwards, or towards the nose. The symptoms indicating an affection of the left third nerve, which might be accompanied or caused by some effusion in its sheath, I advised a trial of iodide of potassium, although very doubtful whether it would be tolerated. In effect, the first dose so upset the patient's stomach that he could not be induced to try another, and Dr. Playne then prescribed some quinine, ammonia, and gentian. This answered very well: the appetite and general health improved, and when the patient came to town on July 7th, I found him looking much better than he had been. There was still, however, ptosis of the left eyelid. He could, when requested, lift the lid to a certain extent by a manifest effort, but it was immediately dropped. The vision of this eye not being absolutely occluded by the state of the lid, he was forced to cover it with a shade, as otherwise he was so embarrassed by diplopia that he could not walk without staggering. I found the recti muscles greatly wanting in power, but not, I think, quite so incapable as when I had last seen him. However the eye was turned outwards constantly, and although, by a strong voluntary effort, it could be carried a very little way towards the nose, and a still less distance upwards and downwards, it was practically fixed in a condition of external strabismus, and was useless for optical purposes.

Guided by my experience of the result of interrupted voltaism in the facial paralysis of the opposite side of his face more than two years previously, I thought it likely, now that acute symptoms had subsided, that a similar mode of treatment might lead to good results in restoring the action of the muscles of the eyeball which were paralysed. Instructed, too, by former experience, I felt that faradaism was not the treatment proper for the condition. The muscles of the right side of the face had quite failed to respond to faradaism, but they were excited by a very mild voltaic current when it was slowly interrupted. So it seemed likely that a mild and interrupted voltaic current was indicated in the present condition. The best mode of applying this was not so evident. When metal rheophores covered with wetted kid were applied to the closed lids, and a current of varying strength employed, either the electric influence was unfelt or it was painful to the skin. There was difficulty, too, both with these rheophores and also with sponges in applying the stimulus exactly where I wished it. I now bethought me of using the finger as a rheophore, and tried it in the following manner. An assistant having aplied to the patient's left temple a sponge rheophore connected with one (it was not material which) pole of a Stöhrer's constant current battery, I grasped in my left hand another sponge rheophore coming from the other pole, and then applied the forefinger of my right hand, covered with a single thickness of muslin wetted with pure water, to the right upper eyelid of the patient. The battery was Weiss's (Foveaux's), which had considerably run down, so that it was perhaps only half-strength. Cautiously increasing the number of cells (it was long before any electric sensation was felt), I found that the current from between 30 and 40 cells could be employed in this manner, my body, through which it was bound to pass, offering a great resistance, and serving indeed as a rheostat. The application was made through the closed lids. The finger proved an exceedingly convenient rheophore. I could apply exactly the amount of pressure desirable, and could reach portions of the globe which it would have been exceedingly difficult to act upon in any other manner. Moreover the strength of the current could be gauged at every instant. That which was employed was just sufficient to cause me to feel a distinct shock in the knuckle of my right forefinger every time the current was interrupted. Occasional flashes of light were observed by the patient, but he felt no pain. We thought we could see a little improvement in power after the first day's application, but there was no doubt of this at all at the close of the second sitting. Not to weary with a daily record, I may say that this treatment was applied on fifteen occasions in all, the applications *extending over a period* of three weeks. The time occupied *at each sitting was from twenty to thirty* minutes. A daily increase in pow-

er of the muscles was noted ; and when the patient returned home, after the last application, he was absolutely well. The lid was entirely under control, and the movements of the left eye were in every respect perfect. Of course, therefore, there was no longer any double vision, and the use of the shade was discarded. The patient has since remained quite well.

Remarks.—I need scarcely say that it is a matter of the gravest import, as regards the prognosis, whether a paralysis of the facial muscles is diagnosed as peripheral or as depending on a lesion of the central nervous system. The importance of this is increased when the patient, as in this case, is a man who has passed the middle period of life; and becomes intensified when, as occurred in the instance which I have described, paralysis of one side of the face is followed by loss of power in certain muscles of the eye on the opposite side. The general conditions, the patient's age, his weak state of health, his family history—all combined to give a very serious aspect to his case, which even his complete recovery would not of itself suffice to counterbalance. For it is quite conceivable that a man of this age, and with such a history, might suffer from a central nervous lesion, possibly small hemorrhages, which could be repaired, and the paralytic symptoms be *ipso facto* removed, and yet that he might be left in a state peculiarly prone to the repetition of attacks which might at any moment involve districts where the occurrence of lesion would have a serious influence upon life. The mere fact, therefore, of this patient's complete recovery does not of itself bear conclusive testimony to the peripheral character of the affections from which he suffered. The electric reaction however, of the facial muscles paralysed in the first attack, lends complementary evidence of a kind sufficient, I believe, to enable us to say that not only was that attack certainly dependent upon a lesion of some part of the facial nerve, not of the nervous centre, but that in all probability the second attack was of similar character. Experience, which by this time has been sufficiently universal to make its results positive, teaches us that when there is paralysis of facial muscles, and these a few hours after the attack show a diminution, rapidly going on to an entire abolition of contractility on exposure to induced currents, whilst contractility is effected with abnormal facility by the interrupted voltaic current, the lesion is not a central one, but involves some portion of the portio dura nerve. I have seen no exception to this rule. The lesion may result from cold, from wound of the nerve, or from compression, but it is always a lesion of the nerve, and not of the nervous centre. It was with great confidence, therefore, that when the test applications of the induced and voltaic currents in this case were followed by the results described, I pronounced the facial paralysis to be of peripheral origin. When in process of time, the second attack occurred, involving on this occasion the oculo-motor nerve of the opposite side, although in the nature of things the application of electrical testing was not practicable, it was not unreasonable to infer that this also depended upon a similar cause to that which had caused facial paralysis two years previously, especially as isolated paralysis of one oculo-motor nerve is almost always peripheral. I ought especially to say that there was good reason to exclude the probability of syphilis in this case, and that there has not been any sign of gout. My prognosis was accordingly favourable, as regards the question of the site of the lesion, although I could not properly give any decided opinion upon the question whether the paralysis would be recovered from or remain permanent. I inclined, however, to the more favourable view, and thought that electrical treatment would be likely to assist recovery.

The voltaic instead of the faradaic current was chosen then, because the paralysis of the eye muscles, like that of the facial muscles, was deemed to be of peripheral character. It seems likely, especially from the researches of Schiff, that induced currents do not determine directly the contraction of muscles, but only act through the medium of the intra-muscular nerves. When these are damaged, as by the influence of cold, the power of causing contraction of the muscles by faradaism ceases. Not so, however, as regards the interrupted voltaic current, the influence of which is now much more marked than it is in healthy striated muscle. Dr. Onimus, of Paris, in some interesting papers which have lately appeared, expresses the opinion that in

cases of paralysis of the facial nerve the muscles, although they do not atrophy, pass into a condition in which the contractile substance resembles rather smooth muscular fibre or protoplasm than normal striated muscle. He reminds us that continuous currents have a much more marked action upon smooth fibres than induced currents, and to provoke the contraction of the unstriated fibres a current of much less intensity is required than for striated muscles. And as with normal smooth fibres so also with those striated fibres which, from an injury to the intra-muscular nerves, have acquired much of the character of smooth muscular fibre. In this mode Dr. Onimus explains the remarkable difference between the action of the induced current and that of voltaism in cases of facial paralysis, as well as the curious fact that the voltaic current acts much more energetically in such cases than in the healthy condition. In the case above related it seems probable that the branches of the portio dura distributed to the muscles, and not to the trunk of the nerve itself, were affected. For the occipito-frontalis muscle escaped, and this omission, which is easily expained if the lesion be supposed to be located in a number of nervous twigs, some of which elude the hurtful influence, presents considerable difficulty if we imagine an injury to the trunk itself. Moreover, the sense of taste was preserved on the affected side, which suggests that the lesion was at least beyond the point where the chorda tympani is given off. The impairment of the cutaneous sensibility, which was certainly more marked than I am in the habit of finding it in such cases (there is often a little numbness), is probably to be explained by a localised influence upon the branches of the sensory nerve (fifth) similar to that exerted upon those of the portio dura. The exact effect upon the muscles, which was brought about rapidly by the influence of voltaism I do not find it easy to explain. It would seem—and this point is extremely interesting—that if we cut off the influence of the will from striated muscular fibre the structure tends to degrade, and, as regards its function, passes into a state closely resembling that which is characteristic of involuntary muscular fibre. The resemblance is threefold: the fibre is no longer contracted by the influence of the will, it is acted upon by voltaism when faradaism fails to affect it, and the action of voltaism upon it is much more marked than upon healthy striated muscle. Apparently the effect of applying voltaic currents to muscular fibre so degraded is to lead it back to its normal condition. It often happens, as it did in this case, that the will acquires its power to cause contraction of the recovering muscles before they will respond to the influence of the induced current, but after they have ceased to be abnormally excited by voltaism. When this occurs it is probably only a question of time as to when faradaism will be able to exert its ordinary stimulating power once more. When I last tested this gentleman's facial muscles, a few weeks ago, I found that voluntary power over them was restored perhaps to three-quarters of the normal extent, that interrupted voltaism affected the injured in no higher degree than the uninjured side, and that the influence of the induced current had again become manifest, though not quite perfectly. I suppose that voltaism replaced the action of the will, as far as concerned the preservation of the muscular fibres, till such time as the intra-muscular nerves had recovered and allowed the passage of the volitional influence. The circumstance that the face has not entirely recovered is, doubtless, owing to the injury to some of the muscular nerves having been irreparable. There is nothing, it seems to me, in such examples as this, which requires one to fall back upon an electrolytic action of voltaism upon the constituents of the nerve-trunk to account for phenomena which are to be explained more easily in the manner described. I think that the very rapid clearing up of the oculo-motor palsy (in the second attack) under the influence of voltaism goes far to prove that the lesion in this, as in the other paralytic seizure, was of a superficial character. The injury at the time electrical treatment was commenced was probably to a great extent repaired, but the muscles which had been cut off for a long time from the stimulating influence of the will had degraded into a state approaching that of involuntary muscular fibre, and were incapable therefore *of being acted upon* by volition to any effective purpose. *The few applications of voltaism* restored the muscular fibres to their natural

condition, and they became both physically and metaphysically "voluntary."

The use of the hand as a rheophore is not new. It has been employed by many for the application of faradaism, especially to the spinal column. But, as far as I am aware, the use of the finger in the manner described for applying interrupted voltaism to the eye muscles is novel. It is certainly very convenient. What we want in such a case is a large quantity of electricity of low tension, and this is, I think, especially well arrived at by interposing the operator's body in the course of the current, and employing a considerable number of cells.—*Lancet*, *Oct.* 2, 1875, *p.* 484.

18.—DRUNK OR DYING? THE CHIEF CAUSES OF COMA, AND THE DIAGNOSTIC MARKS OF EACH VARIETY.

By Dr. GEORGE JOHNSON, F.R.S., Professor of Medicine in King's College, Physician to King's College Hospital.

The attention of the profession and of the public has lately been directed in an especial manner to the means of distinguishing drunkenness from apoplexy and other forms of sudden coma. When I am addressing my pupils on the subject of apoplexy, I am in the habit of referring to the difficult question of diagnosis in the terms of the following extracts from one of my lectures :—

Diagnosis.—You are called to a patient in a state of insensibility ; you know nothing of his previous history, except that he has been found unconscious in the street, and you are required to ascertain the cause of his alarming condition. You must first consider what are the *possible* causes of the symptoms. He may have a clot of blood in his brain, the result of disease or a blow on the head; he may be in that comatose condition which not unfrequently follows an epileptic fit; he may be poisoned by opium or by an excess of alcohol; or he may be suffering from the effects of uræmia.

Now, you will be less likely to make an erroneous diagnosis if you continually bear in mind that in some of these cases an accurate diagnosis is not only extremely difficult, but absolutely impossible until the progress of the symptoms has been watched for a certain time. That the case is one of cerebral hemorrhage would be rendered probable by such symptoms as extreme relaxation or convulsive twitchings of the limbs on one side, lateral deviation of the features, or inequality of the pupils; but with hemorrhage on the *surface* of the brain none of these paralytic symptoms may be present. Marks of external injury, especially about the scalp, should be carefully looked for in every case. A black eye or a cut or bruised scalp may have resulted from a drunken man falling down, but the fall may have fractured his skull or ruptured a blood-vessel in the brain.

That the coma is a sequel of an epileptic fit might be suspected if it were found that the tongue is bitten and bleeding, and if there are hemorrhagic spots beneath the conjunctivæ or the skin; though these signs are frequently absent in epileptic cases. Epileptic coma is usually of short duration, and the speedy return of consciousness removes any doubt that may have existed as to the nature of these cases.

In cases of poisoning by opium, one of the most striking and constant symptoms is extreme contraction of the pupils. The skin, too, is usually bathed in a profuse perspiration. With respect to the contraction of the pupils, it has been observed that in cases of apoplexy with hemorrhage into the pons Varolii the pupils have been as much contracted as in opium-poisoning.

When the patient's breath is tainted by the odour of some alcoholic liquor, we of course suspect that he is drunk. It must not, however, be forgotten that as a drunken man is especially liable to be seized with apoplexy, and to suffer from accidental mechanical injury in the streets of a crowded city, so we may have to deal with the complication of alcoholic intoxication and *cerebral hemorrhage* on a fractured skull. It is a common practice to give

brandy or some form of alcoholic stimulant to anyone who has become faint or giddy, and so it may happen that an unconscious patient's breath is tainted with the odour of drink administered after the onset of an apoplectic seizure.

In cases of uræmic coma the urine is usually albuminous, and presents other physical and chemical signs of renal disease. Uræmic coma, in a large proportion of cases, is preceded by convulsions. The tongue is commonly brown and dry in these cases, and the breath has a most peculiar and characteristic fetor. Yet, even with all this evidence of renal disease, the case may not be one simply of uræmic coma; there may, in addition, be the complication of cerebral hemorrhage, which, as we know, is a frequent result of chronic Bright's disease.

The difficulty of diagnosis between renal disease and drunkenness is sometimes increased by the fact that the urine may be rendered temporarily albuminous by alcoholic intoxication. A remarkable case of transient alcoholic albuminuria occurred when my friend and colleague Dr. Baxter was House-Physician to the Hospital. A man between twenty and thirty years of age was brought in one night by the police. He was unconscious, and breathing stertorously. He appeared to be drunk, and a large quantity of vinous liquid was pumped out of his stomach. The unconsciousness continued, and it was then suspected that he might be suffering from uræmic poisoning. This suspicion was confirmed by the fact that his urine, drawn off by a catheter, was "loaded with albumen." He was then put into bed, cupped over the loins, and a purgative was given. When Dr. Baxter visited the ward the following morning, he found the man up and dressed, and clamouring for his discharge. He said that he had been very drunk overnight, but now he had nothing the matter with him; and he passed some urine which was found to be in every respect quite normal. The temporary albuminuria was the result of renal congestion caused by the excretion of an excess of alcohol through the kidneys.

In all doubtful cases of this kind it is better to err, if you err at all, on the side of caution and safety. Obviously it is better to allow a drunken man to recover his senses in the ward of a hospital than to send an apoplectic patient to die in the cell of a police-station. When a mistake is made on the opposite side, and a supposed drunkard dies apoplectic, it is a very natural, though it may be a very erroneous inference, that some one is to blame and deserving of punishment.—*Medical Times and Gazette, June* 12, 1875, *p.* 630.

DISEASES OF THE ORGANS OF CIRCULATION.

19.—ON THE CURE OF LEUKHÆMIA SPLENICA BY MEANS OF PHOSPHORUS.

By Dr. Wilson Fox, F.R.S., Holme Professor of Clinical Medicine, Univ. Coll., Lond.

[Dr. Broadbent has already drawn attention to the utility of phosphorus in the treatment of leukhæmia splenica, and the experience of Dr. Wilson Fox corroborates his observations. The patient, E. C. U., was by trade a baker, and thirty-seven years of age.]

On admission he was intensely pallid, with extremely marked anæmia of the mucous surfaces and of the nails; markedly emaciated; no eruption of skin; very feeble, hardly able to stand without assistance; no œdema. He had frequent slight *rigors; was pyrexial*, and sweated profusely. The urine *was highly-coloured, sp. gr.* varied from 1010 to 1025; it deposited lithates,

but contained neither albumen nor sugar. The lungs were healthy. The heart's apex (displaced by the abdominal tumour) was in the fourth interspace; there was a faint basic systolic murmur with its maximum at the second left cartilage; venous hum was heard in the neck, and arterial murmurs were present.

His appetite was bad, his bowels were costive, though previously diarrhœa had alternated with the constipation; the stools presented no special abnormal appearance. He suffered much from flatulence. He had constant thirst; mouth dry, tongue broad, flabby, and covered with a thin white fur. The sight was unimpaired. He occasionally suffered from severe headache. Anæsthesia existed over the outer part of the left thigh. Some hyperæsthesia was also observed in the course of the last dorsal nerve.

The abdomen was distended chiefly in the left flank in the splenic region, where there was felt a hard resistant mass pushing outwards the cartilages of the tenth and eleventh ribs, and reaching backwards nearly to the spine, though the intestinal note could be elicited posteriorly between its posterior border and the spine. It was smooth, without any nodulation; movable from behind forwards, and movable on deep respiration. The anterior border was distinct, slightly rounded, and in its middle the splenic notch could be distinguished on deep pressure. The whole mass was absolutely dull on percussion, and without fluctuation. The dulness superiorly extended to the sixth rib in the axilla, between the eighth and ninth ribs in the back. By palpation and percussion the tumour was traced extending across the abdomen to within 1½ in. to 2 in. to the left of the umbilicus; thence it extended transversely backwards until it touched Poupart's ligament, about 1 in. anterior to the crest of the ilium, below which bone it passed posteriorly. The tumour was intensely painful on deep pressure. Between it and the diaphragm friction could be heard. The patient was unable to lie on his right side owing to the aggravation which this caused of the pain felt in the thigh and knee, and to pain in the left scapular region.

No enlarged veins were seen on the surface of the abdomen. There was no ascites. The liver was not enlarged. There was no enlargemnt of any of the superficial lymphatics, nor could any be felt in the abdomen, with the exception of a few slightly in excess of the normal size in the inguinal regions.

The blood drawn by pricking the finger looked much paler than natural. The corpuscles were nearly twenty times their usual number, from thirty to forty-five being seen in the field. This proportion remained constant during the greater part if not the whole of the period before he began to take the phosphorus. The white corpuscles were of two kinds, large and small, the former about twice the natural size; some were binucleated; most were granular. There was, in addition, a large number of molecules, which were aggregated into irregular masses. There was no alteration in the shape or appearance of the red corpuscles.

Until Jan. 20th, when the treatment by phosphorus was commenced, his state varied but little. He had more or less continuous severe pain in the tumour, which at times was aggravated by sharp paroxysmal attacks, relieved occasionally by blisterings and endermic application of morphia, or by the hypodermic injection of morphia.

Until this date no material improvement had taken place in the general condition of the patient. He was still febrile, though slightly less so than on admission; his blood was in about the same state, and the attacks of pain in the region of the splenic tumour were severe. Having just met with Dr. Broadbent's paper, I determined to try the effect of phosphorus, and ordered one-fiftieth of a grain three times a day, which on Feb. 23rd was increased to one-thirtieth of a grain three times a day. All other treatment beyond rest and nourishing food was discontinued. No ill effects were observed from the phosphorus throughout. At first but little appreciable influence was noticed on his general condition, except that the pulse had diminished in frequency, varying up to Feb. 8th from 88 to 96, after which it gradually fell, rarely ever reaching 90, and varying from 76 to 62. The pyrexia also, *as before stated,* subsided, and after Feb. 8th it only reached 99° on two oc-

casions (Feb. 25th and March 5th). Subnormal temperatures, occurring almost exclusively in the morning, but not falling below 97°, were occasional throughout the months of February and March, but almost ceased, though not entirely, during the month of April. On the 25th March he contracted a bronchial catarrh without any pyrexia, which only lasted a few days, and was not treated except by a few doses of chloral hydrate at night, to allay cough.

By the 8th Feb. there was a marked improvement in the appetite, which continued, and the bowels became regular.

By the early part of March the aspect of the patient had begun to improve, and on March 2nd examination of the blood with the microscope showed only about eight white corpuscles in the field of a quarter of an inch, still being divisible into those of large and small-sized, besides a number of molecules.

By March 14th he could walk with help.

By April 6th he was much better; the anæmic look had disappeared, and there was some diminution in the size of the spleen, which no longer passed below the crest of the ilium, while the dulness superiorly reached to the eighth interspace in the axilla.

April 9th. Five to nine white corpuscles were seen in the field of the microscope.

20th. They had diminished to five or seven.

May 5th. There was no apparent excess whatever of the white corpuscles. The patient was able to walk a mile without fatigue. The anterior border of the spleen, instead of reaching nearly to the umbilicus, was five inches to the left of the middle line, and about two fingers' breadth from the crest of the ilium, while the dulness superiorly only reached the seventh rib in the axilla. It was no longer painful.

On the 7th he was discharged for Eastbourne, discontinuing medicine; and in June he returned, looking the picture of health, but without any further appreciable diminution of the size of the spleen. His blood, tested against that of a healthy man, showed no increase of the white corpuscles, but these were nearly double the natural size.

I subjoin his weighings during the latter part of his treatment by phosphoroes. I very much regret that these were not ascertained during the first part of his stay in the hospital:—Weight two years ago in perfect health, 159 and 174 lb.; March 12th, 124 lb.; 22nd, 127 lb.; 30th, 130 lb.; April 6th, 132 lb.; 16th, 133½ lb.; 23rd, 135 lb.; 29th, 140 lb.; May 6th, 142 lb.; middle of June, having returned from Eastbourne, 147 lb.

Remarks.—It hardly appears necessary to comment on the diagnosis of this case as being one of genuine leukhæmia. The change in the blood was certainly not so far advanced as is sometimes observed, when the white corpuscles may be to the red as 2:3. This condition is, however, only noticed as a rule in the final stages of the disease, and even in these the proportion of white to red may by no means be excessive, and, as I have myself observed, they may even diminish from the amount seen in the earlier periods. It appears, also, from Mosler's observations, that splenic enlargement may exist during a considerable period before any marked increase of the white corpuscles is perceptible, during which time other characteristic symptoms of the disease may nevertheless be present, and also that as many as sixteen corpuscles counted in the field may, together with splenic enlargement and slight pyrexia, be sufficient to characterise the disease. Dr. Broadbent doubted whether the case observed by him was an absolutely characteristic one of leukhæmia, on account of the want of correspondence between the degree of anæmia observed and the number of white corpuscles found. I am disposed, however, to believe from observations on other cases, that this want of correspondence is not unfrequent in true leukhæmia, and that the red corpuscles suffer in their nutrition in this disease as well as in the anæmia splenica or lymphatica of Hodgkin, from which a moderate excess of white corpuscles in the blood is sufficient to distinguish it. In this case, however, the increase in their number was *sufficiently great* fully to characterise the disease. The *absence of the severer hemorrhagic* symptoms was certainly a point in the

patient's favour; but in other respects, as regards his emaciation and great loss of strength, his prospects were most unfavourable; and before the good effects of the phosphorus were observed I only anticipated for him the melancholy and painful termination which is almost constantly, if not invariably, observed in this disease. I say almost constantly because Mosler anticipates for quinine, if used in the earlier stages, a somewhat hopeful influence on the cure of leukhæmia, and has quoted four cases of cure by this agent ; I must, however, confess that even in very large doses, of ten to twenty grains daily, continued during a long period, quinine has always failed in my hands to exercise the slightest influence, either on the fatal progress of the disease or on the pyrexia. Iron has also appeared to me to be equally inefficacious, and the experience of the majority of observers seems to have been as unfavourable as my own.

It may be noticed that neither in Dr. Broadbent's case nor in mine did the spleen return to its natural size, though in mine there has been a not inconsiderable diminution of its dimensions. Dr. Broadbent is indeed under some fears, owing to not hearing again from his patient, that some unfavourable change may have taken place in his state. It is impossible as yet to speculate what effect the still enlarged spleen may have on the general health, but the hope that this may be slight or *nil* does not appear to me to be ill-founded. In the cases of cure reported by Mosler under the influence of quinine, the spleen is stated to have returned to its normal dimensions ; but one of these by Dr. Hewson, of Pennsylvania, was distinctly a case of malarial origin, in which paroxysms of intermittent fever still persisted, and in which the administration of the quinine appeared to exert a beneficial effect, while in the others the splenic enlargement was less than in the present instance.

As far as is yet known, no case of spontaneous cure of leukhæmia has been reported, or of recovery under indifferent treatment. The fact that some amelioration had from time to time taken place in this patient's state during the earlier period of his illness affords no ground for the belief that this explanation is valid for the rapid improvement observed after he had commenced to take the phosphorus. Such alternations of improvement and exacerbation are common during the early periods; but when once the splenic tumour has attained a considerable size and the increase of the white corpuscles in the blood is marked, any change for the better, except slight and transient modifications of the pyrexia, are rarely observed.

I believe, therefore, that in this case, as well as in Dr. Broadbent's, the cure is exclusively attributable to the use of the phosphorus, and he is warmly to be congratulated on the successful verification of an induction, and on the discovery of a cure for at least some cases of a disease so painful, distressing, and hopeless as this almost invariably proves to be. It may be found to be more beneficial in the earlier rather than in the later stages of the disease. What its influence may be when the vast excess of white corpuscles sometimes observed has been attained, can only be verified by further observation, but I trust that it will soon receive a more extended trial in all phases of the disorder, and that it may be shown that one more disease has been thus rescued from the category of the almost hopelessly irremediable.—*Lancet, July* 10, 1875, *p.* 45.

DISEASES OF THE ORGANS OF RESPIRATION.

20.—IS CONSUMPTION A FORM OF SEPTICEMIA ?

By Dr. William Marcet, F.R.S.

The maintenance of life and health is a perpetual conflict between the phe*nomena of nutrition* and those of physical decomposition or fermentation and *putrefaction.* The more vigorous the state of health, the more thoroughly

are these physical changes kept at bay; but in proportion as health gives way, so do these physical phenomena, creeping on slowly and insidiously, obtain a hold upon the living body very difficult to shake off. We all know that tissues are ever changing, a constant substitution of fresh molecules to old effete molecules being in progress. This change is a particularly active process, with respect to muscular tissue, for example, requiring, as I have shown ("An Experimental Enquiry into the Nutrition of Animal Tissues"), not only that blood should supply the substances necessary to the new molecules of muscle, but moreover, that it should yield a comparatively large proportion of potash, the only object of which is to combine with the phosphoric acid of the assimilated or organised molecule, so as to make it into a crystalloid phosphate, which substance moves out of muscle back again into the circulation by a mere physical process of diffusion. A movement of a somewhat similar kind takes place, when surface water, with certain substances it holds in solution (others being left in the soil), finds its way out of a field through the drain-pipes. Every fresh molecule of muscle requires a supply of phosphoric acid and albumen with small proportions of potash and magnesia, and these substances have apparently to undergo in the blood a preliminary change, establishing new attractions between each other, in order to become converted into bioplasm or nutritive material. This material is finally organised by undergoing a transformation of a purely morphological nature. Some similar phenomenon must also take place in blood with respect to the nutrition of blood corpuscles; thus there is no part of the living body that is not in a constant state of molecular change, except hard effete matter, such as the nails which are out of reach of the circulation.

If it is borne in mind that the body consists of a mass of molecules always moving, and that the amount of heat required for this molecular change implies the development of a considerable force of energy, it will be readily understood that no physical decomposition or putrefaction of these molecules of matter in physiological motion can possibly take place. I might explain my meaning by referring to a stream of water, which will not freeze even in very cold weather, because the molecules of the water are always in motion, and cannot be acted upon by another force possessed of a tendency to change the molecular form of the fluid; but as soon as it becomes still, then the opposition to the new arrangement of molecules under the influence of cold no longer exists, and ice is formed.

Now, in the same way as in running water fresh molecular attractions or arrangements cannot take place, because of these molecules being in constant motion; so it is that in the living body, where the various molecules of tissue are ever moving, the arrangement of these molecules, necessary for the operation of decomposition or putrefaction to set in, cannot take place. The comparison of nutrition to a stream is defective, however, in this respect, that running water is made up of molecules in movement, and undergoing but a relative change of position; while in the process of nutrition of tissue there is not only a movement of molecules, but also a destruction of old molecules and formation of new ones. These several changes take place through the agency of some power which is not physical—at all events not so in the usual acceptation of the word; but whatever be the nature of the present force, it is this united molecular movement and change which, I verily believe, acts as the cause so thoroughly preventing physical decomposition or putrefaction from taking place during life and in health.

If, however, that wonderful mobility with which living molecules of tissue are endowed should become weakened, and blood lose its power of preparing phosphoric acid, potash, and albumen for the manufacture of flesh; if the morphological change of nutritive material into organised tissue should be lessened in its activity or arrested, and blood yield an insufficient quantity of potash to combine with the whole of the phosphoric acid of an organised molecule; again, if the constituents of mature tissue should no longer become transformed into substances diffusible, allowing of their rapid passage into the circulation,—then physical decomposition will set in, as ice will form in a stream of water on its course becoming slackened or arrested.

The circumstance that urine is, as a rule, constantly being secreted in the

human body, both during and after digestion, and at night as well as in the daytime, appears to me to show that the phenomenon of the nutrition of tissues continues uninterruptedly. Dr. J. L. Prevost, of Geneva, after producing an artificial hernia of the bladder on a rabbit, and incising this organ in a longitudinal direction, observed the urine to run out as a rule alternately from each ureter, with an interval of several seconds between each ejaculation. These emissions coincided with the termination of the vermicular contraction of the ureter, clearly seen to extend to the bladder. In the rabbit, under normal conditions, from seven to eight emissions take place per minute. This phenomenon continues, I understand, uninterruptedly all day long.

Pursuing this same train of thought, and now taking into consideration the changes occurring in the body in disease, it will be readily observed that they frequently bear the character of a simple physical decomposition.

In some cases, as in fevers, ammonia, one of the common products of decomposition of animal matter, is formed in comparatively large amount, while it is only met with in very minute quantity as a normal constituent of the living body; expired air containing traces of this substance, and there being often, perhaps constantly, crystals of ammonico-magnesian phosphate in the fæcal matters.

In severe cases of typhus fever the exhalations from the skin and the discharges from the bowels contain ammonia. Reuling (Murchison, Treatise on Continued Fevers, p. 144) found that the air expired in certain diseases, such as typhus, uremia, and pyemia, contained an excess of ammonia. These results were subsequently confirmed by the independent researches of Richardson. Dr. Murchison adds that in severe cases of typhus the breath has undoubtedly often an ammoniacal odour ; he observes in enteric fever that the stools are very often ammoniacal.

Another circumstance which confirms the view that ammonia in fevers is due to decomposition, is the rapidity with which putrefaction takes place after death in this class of diseases. "In most cases (in typhus) there is a tendency to rapid putrefaction after death, more rapid than after death from other diseases at the same time of the year" (Murchison).

In diabetes the excessive excretion of sugar may be readily accounted for by the occurrence of some circumstance which arrests the peculiarly vital transformation of the amyloid substance, or glucogen, of the liver. This remarkable substance, discovered by Cl. Bernard, undergoes transformation into sugar immediately after death, a phenomenon which may be considered as one of the very earliest post-mortem changes.

In albuminuria (Dickinson, Pathology and Treatment of Albuminuria, p. 234), it is known that the ammonia is increased in quantity. This may be owing to a decomposition of urea present in excess in the blood; at all events, it originates from some physical change taking place in the living body, and opposed to vital power.

In consumption, at first sight no physical metamorphosis appears to take place in the body before death ; but such is not the case. The expectoration may, towards the termination of the disease, emit an obvious faint smell of incipient putrefaction; moreover a change invariably takes place in the chemical composition of the tissues in phthisis, which possesses a purely physical character. First, in muscular tissue the chlorine and soda, as I have shown experimentally, are greatly increased beyond their normal proportions in health. My inquiries yielded 0·167 parts of chlorine (mean of 11 determinations), and 0·237 parts of soda (mean of 6 determinations), for 200 parts of muscular tissue in health. The power which, under normal circumstances, prevents the diffusion of chloride of sodium from blood into muscles apparently no longer acts, or is much weakened, in phthisis some time before the fatal termination, allowing of the chloride of sodium contained in the blood while circulating through flesh, to diffuse itself into that tissue ; hence it is that we find it charged with common salt after death from that disease, one pound of muscle then containing a mean of 21·28 grains of common salt, instead of 9·6 grains.

There is another change I have constantly met with in muscular tissue in *phthisis, which looks* like a commencement of physical decomposition; I am

now alluding to the moist and soft state of these muscles observed in a post-mortem examination; while in all other cases, I believe, the muscles look dry and firm, if examined shortly after death.

This change in consumption appears to me to be owing to an alteration, of a physical nature, in the state of the water in the tissue. A modification of the same kind takes place after a time in the flesh of animals slaughtered for food, and in perfect health; thus meat, after hanging up in a larder for a few days, will exhibit this soft and damp appearance; and ham, even cooked, will often just before it is unfit for food, become quite damp and even wet, a well-known unmistakable sign of incipient decomposition. This change appears to me to begin some time before death in phthisis, a soft, flabby, and often puffy consistence of the muscles of the lower extremities being frequently observed during life; and the examination of muscles, a few hours only after death from phthisis, certainly conveys the idea that the alteration took place before life was extinct. It is true that the proportion of water is slightly greater in muscular tissue in consumption than it is in health, amounting to a mean of 5827 grains for one pound of flesh, instead of 5390 grains; and it is just possible that the dampness is due to that excess of water, although the change appears to me much more likely to result from a difference in the actual physical condition of the water.

I might extend the present remarks, but those I have thought of offering show that, as the vital force becomes diminished, and the power of nutrition of tissues lessened, the tendency to some physical change peculiar to organic matter deprived of life gradually obtains the upper hand, and should this change pursue its course it must eventually destroy life. Let us now consider the case of a punctured dissecting wound. Animal matter undergoing decomposition is introduced into a healthy tissue by accidental inoculation: if the subject of the accident is strong and in good health, the probability is that no mischief, or a mere local inflammation, will follow. How many students prick themselves while dissecting and how very few suffer in consequence of this inoculation! Others, however, who may be in ill-health at the time or exhausted from overwork, will not escape; perhaps on the second day after the accident the first symptoms of septicemia will set in, followed two or three days later by a fatal termination. These are the facts; they are easily explained. When the molecular movement of nutrition is strong and active, the poison has not time to act, the molecules of tissue changing too rapidly to allow of an abnormal kind of molecular metamorphosis to set in; a local inflammation may result from the inoculaton, leading perhaps to the formation of a deep sinus; but if any further absorption of matter undergoing decomposition takes place at the seat of the inflammation, it can do no farther mischief, because of the molecular changes in healthy living tissues defying decomposition and putrefaction. On the other hand, when the molecular movement of living tissues is slow and in want of energy, as it would be in ill-health or a state of fatigue from mental overwork, then the inoculated matter will have time to act upon the molecules of tissue before they undergo their normal change, and generate decomposition in the whole mass, causing a rapid cessation of the phenomena of life. In the operation-ward of an hospital a patient, after undergoing an amputation, is often at the time in a low state of health; at all events, he will be inevitably very much weakened by the operation, and the power his tissues possess of wasting away and forming afresh is considerably reduced. In consequence of this state of his body a tendency to physical change must set in.

After reading Mr. Erichsen's suggestive essay on Hospitalism, the mind dwells involuntarily on hospital septicemia, and the means of arresting such an obvious cause of mortality—a subject the author of the essay has admirably treated. But other considerations also arise out of the present publication, and amongst these the question as to whether septicemia is not a cause of death under other circumstances than operations, and if a putrescent matter cannot originate in the body weakened by disease, instead of being introduced at a cut surface *of an amputated* limb.

But before entering upon this subject, let us ascertain exactly what is sep-

ticemia. Erichsen observes (Hospitalism, p. 72): "By septicemia I mean a blood-disease, a form of typhus or putrid fever, directly occasioned by the absorption into the system of putrescent matter from fœtid ulcers, necrosing cancers, &c., which may then become self-infecting. In it there are no rigors or sweats, but extreme depression of vital power, and usually rapid death with typhoid symptoms. After death no metastatic abscesses are found. . . . It is a disease that may affect the uninjured as well as the wounded; and the reason why a person who has been the subject of a severe operation or of a serious injury is more liable to septicemia than another appears simply to be, that his constitution has been weakened by the shock to the nervous system or by the loss of blood sustained, and that consequently he is rendered less resistant to the invasion of any disease of a miasmatic type." And in another place of the same essay the author remarks (p. 75): "The cause of septicemia appears to me somewhat obscure. It does not appear to be distinctly connected with overcrowding, but rather with the development of putrescent discharges from unhealthy or malignant ulcers. The offensive discharge from ulcerated cancer uteri is supposed by some to tend very specially to its production, and it has been a cause of death in ovariotomy, when practised in the same building in which a woman suffering from this disease was lying."

We have now arrived at the main point of my communication; and I must beg to draw the attention to the state of the body in consumption. Before phthisis, or rather its acute or active stage, sets in, it is now generally acknowledged that there must be either a tubercular or pneumonic deposit in one or both lungs. In some cases softening of this abnormal material, with febrile symptoms follow rapidly on the inflammatory state leading to the original deposit; in others a considerable period extends between the occurrence of the primary change and the outbreak of the acute stage; it may even happen that the new growth remains for many years without giving rise to any active mischief. I have met with many illustrations of these different classes of cases. It is very obvious that, so long as people with deposits in their lungs continue healthy, the present abnormal material undergoes nutrition, otherwise it must be subjected to physical change; but this new formation, which appears to be possessed of no particular function, and must be much less abundantly supplied with vessels than healthy tissue, cannot have so active a nutrition as that of the pulmonary tissue in the sound state; and it may be safely inferred that trifling circumstances, which would exert little or no influence on the normal process of nutrition, might seriously interfere with that of such growths. Among these circumstances must be mentioned, in the first place, the presence of decomposing organic matter in the air breathed, which, acting on the abnormal material as it would upon non-living organic matter, arrests the nutrition of that material, and generates septicemia. If the septic particles floating in the atmosphere are harmless in perfect health, it is because the molecular changes connected with the healthy nutrition of pulmonary tissues are sufficiently active to resist this power of decomposition.

The abnormal growth in the lungs, being no longer properly nourished, breaks down, the state of mal-nutrition extending to the capillary vessels, which become ruptured, and blood is brought up from the bronchial tubes. The sequel of this state of poisoning is often rapid or galloping consumption; and it must be acknowledged that a case of this kind exhibits features so closely allied with those of septicemia, that it is impossible to overlook their near relationship. The high temperature of the body, rapidly increasing emaciation, deficient appetite, and state of prostration establish a marked connection between these two diseases. Finally, unless certain means be adopted which I shall presently refer to, death is nearly certain to close the scene, just as it does in hospital septicemia, although less rapidly. In cases where the septic action of decomposing pneumonic deposits is less virulent, we have a condition frequently met with in consumption, slower in its progress. The main symptoms of this chronic state are a constantly high temperature, *with quick* pulse and steadily-progressing debility and emaciation;

while the physical signs are those of consolidation and breaking down of tissue.

The object of the treatment must be to arrest the septic power of the poison which forms within the lungs, together with the physical changes resulting from its action. Medicines, I regret to say, act as a rule but unsatisfactorily towards that object; at all events, those generally in use in such cases, as quinine or digitalis. What antiseptic medicines will do towards that object remains to be seen; carbolic acid certainly appears useful, but we do not know enough of its physiological action, and cannot tell yet to what extent it may be given safely; perhaps the apparently favourable action of arsenic in some cases of phthisis is due to its antiseptic properties. Preventive measures to the introduction of septic material into the lungs, such as charcoal or cotton respirators, may also be of service. I have obtained very satisfactory results from the use of charcoal respirators, especially among hospital out-patients, who often live in an impure and tainted atmosphere.

There is a means, however, which certainly acts very positively towards obtaining the desired effect; this is removal to a high locality, somewhere on the hills, at a station between 300 feet and 500 feet higher than that where the patient may be residing. I am alluding, of course, to those who may be living within a short elevation above the sea-level; but even should acute symptoms set in at a certain height, say 1000 feet above the sea, it is remarkable how beneficial may prove the mere fact of removing three or four hundred feet higher up.

These remarks apply not only to consumption, but as a rule to all cases with quick pulse, high temperature, debility, and a deficient state of nutrition. I might bring forward a number of instances bearing out this fact, and have already done so on other occasions. The Mediterranean coast is admirably suited to such a means of treatment, as in many places a row of hills rises within a short distance from the sea-side, where patients will find comfortable accommodation at various altitudes above the sea-level. The little town of Cannes, which has an English colony increasing in number every winter, is especially favoured in this respect, villas and hotels having been built on the hills within easy reach of the town.

I make it a rule to be constantly on the watch for a rise of temperature and acceleration of the pulse in my consumptive patients, and if these symptoms with other signs of acute disease show themselves, it is my practice to urge upon them the importance of moving up at once to the hills. I have found such means successful in arresting most intractable hemoptysis, bring severe pneumonia to a successful issue, cut short in a very few days a state of long-continued fever, and in many instances stay the progress of phthisis. —*St. George's Hospital Reports, vol.* vii., *p.* 200.

21.—A RECOVERY BY ARTIFICIAL RESPIRATION, AFTER TRACHEOTOMY, IN A CASE OF DIPHTHERITIC CROUP.

By Dr. Benjamin W. Richardson, F.R.S.

[Dr. Richardson two years ago had a case in which artificial respiration, carried out with the double-acting bellows, led to the restoration of natural breathing five successive times. Very disappointing, however, to relate, the patient afterwards died from extension of the pulmonary lesion. The present case ended completely successful.]

On March 1 of this year I was summoned late at night by my friend Dr. Wilbe, of Finchley-road, to see a little boy five years of age who was suffering from croup, or diphtheritic croup, and who was breathing with so much difficulty, that death from suffocation appeared to Dr. Wilbe to be imminent if tracheotomy were not at once performed. I went provided with everything for the operation. I found the child breathing with the utmost diffi-

culty, owing to the obstruction in the larynx. He was restless, and at times slightly convulsed; his lips were blue, and his body was becoming cold. The breathing was so noisily shrill, from the narrowing of the larynx, that we had some difficulty in making a correct diagnosis of the condition of the heart, but in a brief interval of quiet I detected that both sounds of the heart were clear, and that there was no obvious indication of obstruction to the course of blood through the right side of the heart, from separation of fibrine.

Agreeing entirely as to the necessity for the operation, I performed it at once, Dr. Wilbe administering bichloride of methylene. The methylene produced rapid and gentle general anæsthesia. I opened the trachea as low down as I could conveniently, experiencing no difficulty except from a little excess of bleeding from the divided surface of an unusually large thyroid gland. So soon as the opening was made into the trachea, there was sharp expulsion of air from the lungs, together with extrusion of a portion of false membrane. This over, I introduced the outer blades of Fuller's tracheotomy-tube, and through them the inner tube. The child was now allowed to recover from the anæsthesia, the tube being neatly and firmly tied into position. Free breathing through the tube was soon established, and the return to consciousness, from the anæsthesia, was attended by favourable symptoms. The heaving of the chest ceased, the face lost its lividity, and the surface of the body became warm.

The operation was performed at 10·30 p.m. on a table to which the patient had been removed. He was taken back to bed at 11·5, and fell into a sleep. To watch him during the night, and to prevent suffocation from obstruction of the tube, we obtained the assistance of Mr. F. Otley Lovell, who, in the previous case of a similar kind, to which reference has been made, rendered most prompt and valuable assistance. On this occasion Mr. Lovell was joined by his brother, Mr. W. F. Lovell, who took turn with him in the careful watching that had to be carried out. To prevent, as far as was possible, the danger of death from asphyxia, every available means was provided for clearing the tracheal tube, and for changing it if that were required. I also fitted up the double-acting bellows as on the former occasion, arming the free end of the tube from the bellows with a portion of firm elastic tubing that would readily pass into the tracheal tube should the necessity for artificial respiration become imperative. On meeting Dr. Wilbe and Mr. Lovell in consultation at 10.30 on the following morning, March 2, the report was that the child had slept during the night with only two interruptions. He had fed himself with two teacupfuls of milk. He was breathing comfortably through the tube, his body was of natural warmth, and the asphyxia had entirely disappeared. He passed through this day favourably.

Early next morning—namely, at one o'clock of March 3—the breathing became embarrassed, owing to plugging-up of the tube, and as the tube could not be cleared in position, Mr. Lovell was obliged to remove the inner tube. It was nearly choked with a compact mass of secretion, which adhered with great firmness. The patient now breathed easily through the outer blades of the tube, and they therefore were left simply in place. In a few hours the breathing again became embarrassed; at 3 p.m. the tracheal opening was plugged, and the patient was asphyxiated. The blades were promptly removed, and a portion of membrane was expelled. He now for a short interval breathed through the wound, and then ceased to breathe altogether, and to common observation appeared to be dead. At this juncture, Dr. Wilbe and Mr. Lovell, who happily were present, passed the elastic tube of the double-acting bellows into the wound, and set up artificial respiration. The artificial respiration brought back animation in a few minutes, and natural inspiration followed; but the artificial process had to be repeated, at times, during a quarter of an hour before independent breathing was fully re-established.

After the natural respiration was completely restored, the outer blades and inner-tube were re-introduced into the trachea. The breathing continued easy during the rest of the day.

On Thursday, March 4, at 3 a.m., the breathing having once more become *laborious, the tracheal tube* was cleared with a feather, after which, for seve-

ral hours, the breathing remained free. In the afternoon, the blocking-up again occurred, and at 4.30 p.m., at a consultation at which we were all present, it was agreed to remove the metal tube, and to introduce a larger-sized vulcanite tube. As the new tube was being inserted, some false membrane was coughed through it. The patient continued to breathe easily through the vulcanite tube until 11 p.m., when some temporary obstruction occurred, and the respiration was for a little time laboured. In the course of this day the child ate a little beef finely minced, and some small pieces of orange; at intervals he took a teacupful of milk.

On the morning of Friday, March 5, the breathing again was very difficult. The tube was removed by Mr. Lovell at 4.15, and a still larger vulcanite tube inserted. Relief followed, with sleep for four hours. At mid-day the child showed signs of great exhaustion, was exceedingly restless, persisted in picking the skin beneath the wound, and refused food. There was redness of skin—in fact, a faint erysipelatous blush—round the wound, and an increasing difficulty of breathing. There was also an extreme fetor from the mouth, and a large portion of diphtheritic membrane was discovered on the left side of the fauces. The tube being obstructed, was removed, and a new one put in its place. At four in the afternoon, when we again met in consultation, we deemed it expedient to remove the vulcanite tube in order to introduce one of larger size. The change brought more decided relief, and a large portion of false membrane was coughed up through the tube. The skin around the wound, over which there was the blush of inflammation, was painted with styptic colloid. In the evening the child took food, and falling asleep soon afterwards, slept until after midnight.

At 1.40 on the morning of Saturday, March 6, the breathing was arrested by an obstruction within the tube. Dr. Wilbe, who on this occasion kept watch, removed the tube and replaced it with a clean one, and with the usual relief. After this, the child coughed up much mucus from the lungs, took food, and at 3.45 fell asleep. Later in the day, Mr. Lovell had occasion to remove and clean the vulcanite tube twice, owing to the urgent difficulty of the breathing; but the secretion with which the tube was clogged was much less firm and tenacious. The inflammatory redness around the wound was less, food was taken with relish, and the little patient was able to play with his toys. At 10.15 the breathing was again attended with so much difficulty, that the tube, which was clogged, had to be removed and replaced. After this, a fair night was passed. In the course of Sunday, March 7, the tube was removed, cleared, and replaced twice; a good night followed.

On Monday, March 8, the tube was removed, and was replaced by a clean one at 8.15 a.m. In the afternoon of the same day, after visiting the patient with Dr. Wilbe, we found the breathing sufficiently free when the vulcanite tube was out of the trachea to warrant the suggestion that the wound should be left simply open. The patient was now fairly convalescent.

From this time recovery took place rapidly. There was a slight paralysis of the glottis, and for a day or two, when the patient swallowed milk, a little of it flowed into the trachea, and escaped by the wound. But this difficulty soon passed away. The external opening healed up soundly, and in a few weeks I had the pleasure of making a friendly call, with Dr. Wilbe, to find the boy restored to perfect health.

It is difficult, in recording the facts of a case such as the above, to avoid the expression of an enthusiasm which, however natural, were best concealed. But the facts, accepted with all the reserve which ever belongs to the true historian of scientific results, possess a practical value which may, and indeed ought, to be earnestly enforced. They add, in the first place, an importance to the operation of tracheotomy, which Antyllus little dreamed of when first he ventured to suggest it, and to describe with so much simple accuracy the mode in which it was to be performed. They add a new importance to the experiment of Robert Hooke, on which he founded the process of artificial respiration. They show the modern physician that by his chirurgical skill he may even restore life, when life itself, to the common observer, is beyond recall. The *practitioner*, armed now with the means of restoring the *respiration through the opening* he has made into an obstructed windpipe,

will feel that so long as ever there is evidence of life, though it be even such evidence as can only be detected by the stethoscopic examination of the heart, there is a chance before him of resuscitating by the plan of combining the operation of tracheotomy with artificial respiration. It is clear that in many such cases he will succeed, and, with a few exceptions, he is bound to make the attempt at success.—*Medical Times and Gazette, July* 17, 1875, *p.* 64.

22.—COPAIVA IN CROUP.

In the "Transactions of the Medical Society of the District of Columbia," vol. i., No. 1, after relating a case, Dr. Lincoln wished to draw attention to a very important remedy in the treatment of croup—copaiva—which he considered of the greatest use in this and similar cases. He thought it prevented the re-formation of false membrane. On the night referred to in the report, when he removed the second specimen, he found the child as bad as ever, labouring under dyspnœa from false membrane in the air-tube. He removed the inner canula, but found no membrane in it: sent for copaiva, and in the meantime applied a mixture of copaiva and glycerine (of which a small quantity was in the house) to the inner canula, which he then reinserted. This produced a paroxysm of cough, and a piece of membrane was thrown out. He afterwards gave one drachm of copaiva, with prompt relief: since then had applied a mixture of copaiva to the inner canula with great benefit, according to the statements of the parents. There were still some patches of membrane about the palate. Has seen the efficacy of copaiva in many cases; in one, a case of very severe membranous croup, a full dose of one drachm would again and again relieve the urgency of the symptoms, and the child recovered. He would have performed tracheotomy in the case but for an existing vitiated condition of the system.

As to chloroform, Dr. Lincoln considered that in Dr. Walsh's case no danger need have been apprehended from the anæsthetic, as instruments were at hand ready to open the trachea at any moment. He thought, however, the apparent final success was due to the copaiva.

Dr. Miller has used copaiva extensively in croup for thirty years, and had before spoken of its efficacy. He was in the habit of placing a phial of balsam copaiva in possession of all his patients subject to croup, directing them to take doses of twenty or thirty drops before sending for medical aid. The result was, that whilst he used to be frequently called out at night to attend croup cases, he was now but seldom annoyed at night by similar calls. So great was the faith of his patients in this remedy, that he had often been applied to for his so-called "croup medicine." It was especially valuable in the early stage.

Dr. Lincoln had never seen copaiva fail if given in the first stage of the disease, and had derived great benefit from it in every period of the complaint. In reply to a question by Dr. Fenwick, he said the remedy was of great use, even in the pseudo-membranous form of croup.—*Practitioner, May* 1875, *p.* 365.

23.—ON TAR AND IPECACUANHA SPRAY IN THE TREATMENT OF WINTER COUGH.

By Dr. William Murrell.

The drug used was wood-tar, the *pix liquida* of the Pharmacopœia. This was made into pills, each containing two grains, by mixing it, by means of a *gentle heat, with a grain of* wax and two grains of powdered liquorice root.

Some difficulty was experienced in coating these pills, as the spirit used for this purpose dissolved out the tar. In private practice, we have, therefore, usually employed small capsules, each containing from two to three grains. Larger capsules, similar to those used for copaiba, are also made, but they contain a larger dose of the drug than it is necessary to administer in cases of bronchial catarrh. There are several other preparations containing this drug which are largely used on the continent, and might with advantage be introduced into this country. The *dragées de Christiania au goudron de Norvège* are elegant little bonbons, each containing five grains of tar. Tar-water, or "eau de goudron" is also made, which contains two grains in the drachm, and may be taken in sugar and water, or with claret at dinner, the combination beng almost tasteless.

The observations on the treatment of chronic bronchitis and winter cough by the ipecacuanha spray were orignally published in August last. As a considerably increased experience of this method of treatment, both in hospital and in private practice, has not only confirmed our previous statements, but has added several new points of interest to our knowledge of the subject, a brief *résumé* may prove not unacceptable. The inhalations prove most useful in those cases in which the patient suffers from cough and dyspnœa on exertion during the winter, but is comparatively free from these symptoms in summer. The expectoration is usually abundant, and is often frothy and expelled with difficulty. There is never any true hemoptysis, although the expectoration may be occasionally streaked with blood after a violent paroxysm of cough. This condition may be accompanied by considerable loss of flesh, lowness of spirits, and other symptoms, which quite incapacitate the patient from following his occupation during the winter months. In these cases, almost without exception, the patient either comes of an asthmatic or phthisical family, or he follows some employment which necessitates his exposure to cold, or wet, or dust. Many of these patients suffer from gout or chronic rheumatism. On making a physical examination of the chest, only a little emphysema may be detected, or there may be sibilus over both fronts and backs, with bubbling rhonchus at the bases. It is very necessary in these cases to ascertain the absence of organic cardiac mischief. A patient, who last year suffered from bronchial catarrh, and was greatly benefited by the ipecacuanha spray, applied for relief this winter. The old treatment was adopted but with little benefit; and, on a more careful investigation of the case, it appeared that the patient had, during her absence in the summer, suffered from rheumatic fever, and that the dyspnœa was due to mitral regurgitation. The spray has proved most successful in those cases of winter cough in which the dyspnœa is the prominent symptom. In true neurotic asthma, however, little or no benefit is derived from its employment, and it may even increase the frequency and duration of the paroxysmal attacks. The spray has been used with advantage in a few cases of phthisis, both in the early and in the advanced stages, but our experience upon this point has been limited.

The method of giving the inhalation may be now considered. In our earlier experiments, Richardson's double-balled spray-producer, such as is used for ether, was employed; but during the past winter the number of patients under treatment at the hospital has necessitated the employment of Siegle's steam spray-inhaler. The ipecacuanha wine was used either pure or variously diluted, the most usual strength being one part of the wine to one or two of water. The use of undiluted wine occasionally produces dryness of the throat and nausea, the latter symptom most frequently occurring in those cases in which the patient is not careful to expectorate the mixture of saliva and condensed spray which accumulates in the mouth. The quantity of wine used at each inhalation varied from a half to two drachms; in a few cases as much as an ounce was given, but with no advantage over the smaller quantity. The Richardson's spray-producer atomised one minim at each squeeze of the ball, so that about 150 squeezes were usually given when a mixture of one in two was employed. The Siegle's apparatus, when fully at work, vaporises a drachm in about three minutes. The inhalations were given daily, the patient usually requiring ten or twelve.

The benefit derived from the spray, though often prompt, is in many cases of several months' duration. All the patients under treatment last year who have returned this winter, have stated that they have been freer from cough and dyspnœa than usual during the summer months.

During the past winter, other drugs, including carbonate of ammonia, iodide of potassium, and tartar emetic, have been used in the form of spray in the treatment of these cases, but the results have not been satisfactory.—*British Medical Journal, May* 29, 1875, *p.* 706.

24.—ON PYTHOGENIC PNEUMONIA.

By Drs. T. W. Grimshaw and J. W. Moore, Dublin.

"*Bad hygiene* increases the amount of pneumonia, and so does *imprisonment.*" In illustration of this statement reference may be made to the accounts of local epidemics lately recorded by various writers.

In the Medical Times and Gazette, April 4, and June 20, 1874, a remarkable outbreak of this form of lung disease, at East Sheen, London, is described under the title of "Sewer-gas Pneumonia." The Irish Hospital Gazette, November 1, 1874, contained the following abstract account of the outbreak in question :

"*Sewer-gas Pneumonia.*—On Saturday, March 14, the parish sewer in the road exactly opposite a first-class boys' school at East Sheen, Mortlake, London, S. W., was opened by order of the Rural Sanitary Authority, for the purpose of inserting a ventilator protected by a charcoal screen. Mr. Waterfield, the head-master of the school, remonstrated, and backed up his own scientific objections by a certificate signed by several eminent medical men, including Sir W. Jenner, Bart., two of whose sons were students at the school. Sir W. Jenner especially mentioned the danger of pneumonia in connexion with the probable escape of sewer air in the vicinity of the school. The Sanitary Board persisted in carrying out their intention, with a trifling modification. On Friday, March 20, a high tide in the Thames blocked up the mouth of the sewer, and the compressed gases forced an opening through the ventilator. The rooms of the school facing the road were filled with a foul-smelling sewer air. Next morning a boy sleeping in one of these rooms was taken seriously ill with pneumonia ; on the evening of the same day two other boys and two servants became similarly affected. One of the servants ultimately died. Mr. Waterfield at once broke up his school for the time being. In consequence of strong representations, the Sanitary Board removed the ventilator and closed the opening on the evening of the 21st. after which all smell ceased, and no additional cases of illness of any kind occurred in the house. As a rider to this instructive history, we have only to add that for fifteen years no illness attributable to drainage evils had occurred, and that two inspectors, sent down by the Local Government Board, pronounced the sanitary arrangements of the school-house to be excellent."

Dr. L. Dahl describes an outbreak of pneumonia in the Akerhus Prison, Christiania. It commenced on December 18, 1866, and terminated in May, 1867. Among an average of 360 prisoners in that period, 62 cases occurred, of which 15 terminated fatally. The weather was very cold at the height of the epidemic, but the prisoners who worked indoors were about equally attacked with those who worked in the open air. Professor W. Boeck attributed the outbreak chiefly to *overcrowding ;* and Dr. Dahl draws attention to the improved state of affairs coincident with a diminution of the number of prisoners from 387, on January 1, 1867, to 278 on December 31, 1867. A former similar outbreak in the prison occurred in 1847, and coincided with a prevalence of *scurvy.*

In a paper, entitled "My Experiences as to the Causes of Inflammation of *the Lungs,*" Thoresen, of Eidsvold (Norway), mentions the occurrence of *several cases of croupous* pneumonia near some glassworks, at a time when

the disease was almost absent from the town. The epidemic was confined to a single row of cottages, and lasted about a month—from July 19 to August 22, 1869, *when diarrhœa and cholerine* prevailed, both at the glassworks and in the neighbourhood—that is, during a "gastric epidemic constitution."

Dr. Bryson describes a very remarkable epidemic of pleuro-pneumonia, in some ships of the Mediterranean Fleet, in 1860. The disease was of a low, asthenic type, accompanied with great congestion of the lungs, and in many cases, on board the ship chiefly affected—the St. Jean d'Acre—with *scorbutic symptoms*. Cachexia was marked, and *diarrhœal and dysenteric attacks* were common both in the early and in the later stages. The most tangible causes of the malady were *over-crowding* and most defective *ventilation*. There were good grounds for supposing that the affection was communicated by the sick landed from the attacked vessels to other patients in Malta Hospital. Dr. Bryson was able to trace several points of resemblance in the symptoms of this pleuro-pneumony to the lung disease in cattle.

The origin of pneumonia, in the instances just quoted, under conditions usually regarded as exciting causes of typhus (*overcrowding* and *defective ventilation*), and of enteric fever (*fœcal miasm*), and the apparent *contagiousness* of the disease when it arises under such circumstances, seem to justify us in giving to this type of pulmonary inflammation the distinctive and etiological title "Pythogenic Pneumonia."—*Dublin Journal of Medical Science, May* 1875, *p.* 404.

DISEASES OF THE ORGANS OF DIGESTION.

25.—THE TREATMENT OF TAPEWORM BY CREASOTE.

By Henry Brickwell, Esq., Somersham, Hunts.

Some fifteen years ago a man, discharged from the army with lung disease and tapeworm came under my notice, when it occurred to me that the destructive properties of creasote to the lower grades of animal life might be made available for killing or so weakening the vitality of intestinal worms that they could easily be got rid of. I therefore gave him some three times a day, shortly after meals, for six days, and on the seventh a dose of castor oil and turpentine, which brought away a worm twelve yards long. I have since tried creasote for destroying round worms with great success. In one case a large mass of more than a hundred worms of all sizes came away, and the patient has not been further troubled by them. I have not succeeded so well with the troublesome thread worms of adults, but have some doubts if the remedy were fairly tried. I have just had the following case of tapeworm:—

W. E., aged twenty-three, labourer, pale, sallow, and sickly-looking, but fairly fleshy, came to me with hæmoptysis and symptoms of tubercle in the lung, which passed off, and he was able to work through the winter. Four months ago he came to me suffering with the prevailing malady, bronchitis, and he then first began passing portions of tapeworm. I deferred treating him for the latter until his health was better. A month ago he returned in fair health, having frequently passed portions of worm since his last visit. I gave him one drop of creasote made into a pill with pulv. tragacanthæ co. three times a day, half an hour after each meal, so as to impregnate the ingesta. As the stomach bore the medicine well for two days I increased the dose to two drops three times a day for two more days, and *then to three drops* at a time for two more days. On *the seventh day I gave him* a dose of castor-oil (aperients acted very

strongly on this patient, or I should have combined it with sp. terebinthinæ). On the fifth day of the treatment a worm eight yards long came away, and he had slight diarrhœa. Not seeing me, he continued the creasote on the sixth day, and took the oil on the seventh, which acted very freely, but brought no more worm away. There appear to have been no symptoms to indicate the presence of the worm until he began to pass portions of it. He had, however, complained of a feeling of weakness, sinking, and faintness for several years, more particularly in the evening. These feelings have now disappeared, and he is stronger, better, and more healthy-looking than before.

The two points that have struck me are—first, that he began passing the worm during a febrile attack (could that have influenced the vitality of the worm, and so tended to its passage?); and, secondly, that he had a chest complication. It is a curious coincidence that these symptoms should have coexisted in the only two cases of tapeworm that have come under my notice. —*Medical Times and Gazette, September* 18, 1875, *p.* 328.

26.—PRACTICAL REMARKS ON THE CAUSES AND TREATMENT OF SOME COMMON FORMS OF VOMITING.

By Dr. Paul Henry Stokoe, A.B., Peckham Rye, S.E.

The most severe and protracted attacks of vomiting I have witnessed have ensued from over-stimulation during pregnancy; under which circumstances there has existed a condition of the volition so disorganised as to reduce the power of self-restraint to total abeyance; the miserable sufferers finding it impossible, in their intolerable drought, to refrain from incessantly imbibing huge draughts of any handy thirst-quencher, to the serious augmentation of their distress.

In these cases the firm hand and inflexible will of an experienced nurse will alone supply that element of control which is wanting; and if we are sufficiently explicit in limiting the quantity of liquid to be taken and exact as to its quality, we may expect the more urgent symptoms rapidly to subside; we shall then be in a position to administer such medicaments as the irritable condition of the stomach requires, while the uterine derangement will be best met by the contact of pessaries containing belladonna and opium with the mouth of the womb. It may be remarked, by way of caution, that the above-mentioned condition is sometimes associated with albuminous urine, even in the earlier months of pregnancy; and when it is so the young and over-anxious practitioner must not be too prone, in the absence of other reasons demanding his interference, to induce abortion; as he will almost invariably find that the albumen will disappear with the evolution of the fœtus long before danger-point is reached.

Less severe but more numerous are the cases of vomiting which result from gastric irritation brought on by alcoholism without other complication; and in them we have almost every conceivable difficulty to contend against. An infatuated patient who deceives both you and herself; a disease constantly recurring from the repeated application of the exciting cause; an obscure train of symptoms, often with the impossibility, or inadvisability at least, of putting leading questions, which are likely to arouse a spirit of opposition; while we ourselves are swayed by conflicting feelings of sympathy and reprobation; so that we cannot too carefully investigate the symptoms (mostly subjective) which characterise alcoholism in its earlier stages. We may at the outset observe that there are two well-defined conditions of alcoholism in which vomiting is a prominent symptom. In one the vomiting is the result of an oft-repeated debauch, of the previous night perhaps, in which case we *may trust to the offender's* sensations of wretchedness, backed by the more *material agency of the* vomiting, to work a cure, for the present at least; in

the other the vomiting is due to altered gastric secretion and to degenerative changes resulting from chronic inflammation of the coats of the stomach; a condition which is more or less remediable, until, through long continuance, thickening takes place locally, the vital organs become congested, and the digestion and other functions of life are permanently impaired. My experience compels me to affix the stigma of frequency in this latter form of vice on the female sex, men being more prone to the less secretive modes of indulgence. If the patient be a gentlewoman she will never acknowledge her weakness until recurrent attacks render it patent; hence it is of much importance that we do not overlook the obscure signs which mark the complaint in its infancy. You will find the subject of it a nervous, fluttering, excitable creature; restless and incapable of carrying out any settled plan or occupation, or of taking rational interest in anything. She is no reader, rarely if ever a good domestic manager, as the ill-conditioned appearance of her household testifies; but is rather the victim of the vapours and general malaise: she is greedy of change, must have excitement, may be at the theatre, not seldom at the conventicle; is the subject of neuroses, which may have a gouty or rheumatic source, or originate in nervous degeneration from alcohol. She is hysterical in fact, sometimes from a recent quarrel with her unfortunate helpmate, sometimes from pangs of remorse at her wretched infatuation. We shall find that her tongue is usually coated, especially of a morning, with a thick creamy fur; but sometimes it is preternaturally clean and glistening; it is also tremulous, her feet being equally so; while this unsteadiness is less noticeable at first in the hands. The breath may be sickeningly offensive; nausea or vomiting is seldom absent, and is most common in the earlier hours of the morning. Diarrhœa is also a very frequent concomitant, coming on before she leaves her bed, and going to the extent of five or six loose bilious evacuations in the day. Sleeplessness too is a constant and great aggravation of her sufferings.

She will assign fifty different reasons for her ill-health; all, in the absence of signs of organic lesion, insufficient to account for the frequency of the attacks. You will probably ascertain sooner or later that she does not intrust her health to you alone, but is in the habit of procuring other advice in order that your suspicions should not be excited by a too frequent recourse to your aid. Under these circumstances you will act wisely in putting a direct question to her husband if she have one; and if not (for old maids and young ones too, and widows when disappointed of their proper *rôle* in life, too often substitute an unnatural for a natural excitement), you must make an opportunity of questioning her friend or servant—and herein is no breach of confidence—and having by this means put your hand on the diseased spot kindly and seriously tell her what is the cause of her ailments and what their only cure. When a lady has once constituted her medical attendant her father-confessor it is marvellous with what assurance she will on each repetition of an outbreak confide to him the cause.

Need anything be said about remedies in such a case? The bane and antidote are both before her. The water she mixes with her brandy (for, sad to say, high-born women are not above this vulgar drink!) will if taken pure and simple soon cast out the evil spirit; but unfortunately it requires a steadier hand and a stronger will than hers to pour it out and convey it to her lips; and if she will not consent to place herself under some restriction, such as that of a sensible friend or a trained nurse, it will be found that all attempts at amendment, however sincere and well-directed, will be frustrated by a constant turning aside from the use to the abuse of stimulants. The approved remedies, ice, effervescing draughts of soda-water and of citrates of potash and ammonia, bismuth, and prussic acid, will, so long as stimulant is refrained from, afford relief; and sometimes under the attacks of horrible depression, from which the dipsomaniac is wont to suffer, dry champagne or brandy and soda-water will be required, but nothing short of total abstinence will effect a permanent cure. It is so much easier to give utterances to promises of amendment when sick than to carry them out when hale, that we may expect the most solemn assurances to be again and again broken, until the patient declines from the pitiable condition of the occasional toper into

the disgusting state of the confirmed drunkard. Meanwhile all the resources of therapeutics will have been exhausted; treatment which has proved beneficial in one attack fails in the next, and we run through over and over again in every possible combination the catalogue of effervescing salines, opiates, belladonna, creasote, bismuth, and so on; we apply cataplasms and wet compresses to the epigastrium, or more powerful still blisters (which not inappropriately carry with them some punishment), and sometimes sprinkle morphia in half-grain doses over the vesicated surface, or use the more trustworthy hypodermic injection of the same. If she be warned in time and amend before it be too late, iron combined with ammonia will serve as a temporary substitute for the alcohol until such time as the nervous forces be restored, and nux vomica will be found to materially assist the flagging energies of the digestive and nervous systems.—*Guy's Hospital Reports*, 1875, *p.* 486.

DISEASES OF THE URINARY ORGANS.

27.—BENEFICIAL USE OF JABORANDI IN CASES OF DIABETES INSIPIDUS, OR POLYDIPSIA.

By Dr. T. Laycock, Professor of the Practice of Physic and of Clinical Medicine in the University of Edinburgh.

The following case of polydipsia was the subject of a clinical lecture by Dr. Laycock during the last winter session, in which he pointed out that the disease in both forms of diabetes and in certain kinds of Bright's disease and dropsy is a *neurosis*, having its seat in that part of the encephalon which regulates the amount of water in the blood, and having, therefore, both anatomical and functional relations with the sudoriparous glands and the kidneys, and with the appetite for water and the sense of thirst. The pathology and clinical history of both kinds of diabetes were discussed, and tne experiments of Claude Bernard and others, as to the production of polyuria, albuminuria, and glycosuria by injury of certain portions of the floor of the fourth ventricle, were alluded to as having a distinct relation to the study of those diseases clinically.

Case 1.—(Reported by J. M. Brown, M.B., class-assistant to Professor Laycock.)—Wm. K., aged 40, a shoemaker, was admitted to Edinburgh Royal Infirmary Dec. 24th, 1874. He complained of great thirst, a feeling of pain and heat from the lips to the stomach, profuse urination, and a tendency to pass water frequently; also of dimness of vision. His previous health had been good until about five months prior to his admission. During these five months he had suffered much from thirst, which was most severe at night and in the morning. He had a hard chancre many years ago, but no other personal indications of syphilis subsequently. His wife had consecutively seven still-born children. As to his social history, he had drunk considerably of whisky, having a bout of drunkenness, lasting for several days, about every three weeks.

Condition on admission.—He is a slightly built man, 5 ft. 4½ in. in height, and weighing 8 st. 4 lb. The integument is hard and dry; temperature 98°. He stated that he did not think he had perspired for five months. The circulatory and pulmonary systems gave normal results, with the exception of a little emphysema of the anterior margins of the lungs. Pulse 92; respiration 16. The tongue somewhat furred, but at the anterior part of the dorsum a small patch is seen, about the size of a threepenny piece, denuded of epithelium, and appearing raw and glistening. The fauces are slightly congested, but quite moist. The appetite is impaired; bowels are regular. Hepatic

and splenic dulness normal. He has sometimes to micturate every half-hour. The urine is pale, almost colourless, faintly acid, sp. gr. 1005; chlorides, phosphates and urea only in small amount; traces of indican; no sugar or albumen, and no organised or crystalline deposits: in short, it exhibits only the character of a very dilute urine. The testicles are rather small. He states that he has occasional nocturnal emissions, and feels competent for sexual congress. He sleeps well, and is intelligent. Cutaneous sensibility unimpaired. On examining the right eye ophthalmoscopically, the optic nerve was found to be atrophied.

The quantity of urine passed daily during the first week after admission was as follows :—

From 3 P.M.	Dec. 24th	till 3 P.M.	Dec. 25th,	420 oz.
,,	,,	25th	,,	,,	26th, 500 oz.
,,	,,	26th	,,	,,	27th, 300 oz.
,,	,,	27th	,,	,,	28th, 400 oz.
,,	,,	28th	,,	,,	29th, 400 oz.
,,	,,	29th	,,	,,	30th, 330 oz.
,,	,,	30th	,,	,,	31st, 400 oz.

The patient was ordered a good diet, with two pints of milk daily, and as much ice as he chose to take with his liquids. He also took ten minims of dilute sulphuric acid and ten minims of tincture of opium every four hours. This mixture was continued till Jan. 4th, when the amount of urine in twenty-four hours was 366 oz. No good having resulted, twenty grains of iodide of potassium and a quarter of a grain of extract of belladonna were ordered thrice daily. On Jan. 15th it was observed that there was a certain periodicity as to the quantities of urine passed daily, as the following statement shows :—

Jan. 11th to 12th, 228 oz.	Jan. 13th to 14th, 200 oz.
,, 12th to 13th, 272 oz.	,, 14th to 15th, 366 oz.

Five minims of liq. arsenicalis were given along with the iodide. The patient was desired to take as little fluid as possible. He became very fond of the iced milk and water, and was sometimes observed to drink it ravenously. A warm-water or hot-air bath was sometimes administered, and on one occasion the latter induced a slight cutaneous transpiration, limited, however, to the thoracic and axillary regions. This treatment was continued till Feb. 2nd, the quantity of urine daily passed varying from 256 to 356 oz., and the specific gravity from 1005 to 1007; chemical characters as before, except that no indican was discoverable.

During the preceding period he occasionally complained of pain in various parts of his abdomen, back, and under the nipples; these pains were generally relieved by mustard epithems, or friction, sometimes assisted by a carminative. The intestines were on those occasions often inflated, and splashing sounds could be produced by slight manipulation of the abdomen. On Feb. 2nd he was ordered three grains of freshly prepared extract of valerian in pill thrice daily; on Feb. 8th, two pills thrice daily; on Feb. 10th, three pills every four hours. On Feb. 11th he had taken fifteen pills, and felt sick and depressed. On the 14th he took no valerian pills, but from the 15th till the 26th he took 6 pills daily. The quantity of urine passed during the period the valerian was administered diminished pretty steadily from 308 oz., sp. gr. 1008, on Feb. 4th and 5th, to 240 oz., sp. gr. 1010, on Feb. 15th and 16th. From this date (the valerian being omitted) till Feb. 26th it steadily increased to 300 oz.

On Feb. 26th the patient was still complaining of great thirst, and the skin was dry. Jaborandi was then ordered in the form of infusion of the strength of one drachm of the leaves and twigs to six ounces of water; of this a dessert-spoonful was taken every four hours. On Feb. 28th a tablespoonful of the infusion was given every three hours; on March 1st a tablespoonful every two hours; March 4th, two tablespoonfuls every hour. On March 5th the skin of the back, abdomen, and inner aspect of the thighs was found to be perspiring pretty freely. *On the 6th (the* jaborandi being continued as when last *mentioned) the skin of the arms and* of the left palm perspired. 15th: The

quantity of urine has declined steadily from 300 oz. on Feb. 26th to 236 oz. on March 14th. 31st: The treatment with the jaborandi having been continued, the quantity of urine passed to-day was 180 oz. The patient has found his mouth uneasy several times, and the amount of the infusion to be taken (varying from one to two tablespoonfuls every hour) is left to his own sense of comfort or discomfort. His skin is moist, and he declares himself much easier and better in all respects, but still has "some of the old burning feeling in the throat and gullet." April 2nd: The sense of discomfort in the mouth amounts to-day to pain in the teeth and some slight difficulty in opening the mouth. He is ordered to take the jaborandi less frequently.

The quantity of urine continued to diminish steadily till the middle of May, when it amounted to 120 oz. per diem. His mouth also had become moister. The patient was then, at his own request, discharged.

The measurement of the urine in this case was most carefully conducted by the patient and nurse, and latterly by the patient alone, as he became more interested in the progress of his own case. The measurement of the liquids taken was more difficult, and was at first erroneous for obvious reasons, so that the discrepancy between the amount taken and the amount passed was great; but as the thirst diminished, and the man became in earnest as to the measurement of the fluids taken and urine passed, there was seldom more than 20 oz. difference between the one and the other.

Case 2.—(Reported by Fabian Alsop, M.B., resident physician, University Clinical wards.)—William W., aged thirty-five, a clerk, was admitted to the Royal Infirmary, Edinburgh, under the care of Dr. Laycock, May 29, 1875. He complains of passing a large quantity of urine, and of a desire to pass it frequently. Also of great thirst, and that he feels inclined to drink a great quantity of water at a time. The water he drinks appears to him to have a sweet taste, especially when it is cold. Patient says that these symptoms commenced nine years ago, during an attack of what the doctor who attended him termed "rheumatic fever." He says that he drank as much water then as he does now. Twelve years ago he had a swelling in the groin after connexion with a woman who would have been likely to communicate infection to him; and five years ago had the venereal disease, for which he was admitted to the infirmary, and, whilst in hospital, had his left testicle removed, and was dismissed cured. Two years after this he was readmitted, and was treated (patient says) for pneumonia. Three months ago a small papule formed at the back of his right thigh, which was not attended to, and which ended in a small ulcer about six weeks ago, and has not yet healed. Ever since his testicle was removed patient has been subject to severe frontal headaches and a feeling of giddiness, which come on him occasionally. His father and mother both died, he states, of consumption; otherwise the family history is satisfactory. He has had a comfortable home and always been well clothed, but has been given to sexual excesses and frequently has been "the worse of drink."

Condition on admission.—Patient is somewhat emaciated, and below the average development; height 5 ft. 6 in.; weight 8 st. 7 lb. His muscles are small and rather flabby. He can lie easily in any position, and is not confined to bed. He has a somewhat anæmic aspect, but his expression is natural. Temperature on admission 97.6°. Skin very dry and rough. Does not perspire at all. No eruptions nor tumours on the body. There is a small ulcer, about the size of a florin, on the posterior aspect of the right thigh, with a greyish surface, and which discharges a small quantity of fetid pus; otherwise his limbs are natural. Patient has to micturate frequently, having generally to rise three or four times during the night. Through the day he passes urine, without pain or difficulty, about every two hours, amounting in twenty-four hours to 158 oz. of a very light yellow colour, much resembling the colour of hock; sp. gr. 1008, of acid reaction; contains albumen, which occupies about one-eighth of the test-tube when the urine is allowed to stand after boiling; chlorides are abundant in quantity, so also is the urea; no sugar present; no tube-casts to be discovered under the microscope. Patient's *tongue is clean. He feels* very thirsty, and in order to quench his thirst has *to drink a large quantity* of water at a time. Has a very pleasant feeling at *the back of his throat* while he is drinking water. His bowels are very ir-

regular in action; some weeks being very constipated, at others loose. Viscera of abdomen natural. Number of respirations 20 per minute. Has no cough nor breathlessness. Physical examination of lungs natural. Pulse 72 per minute; regular in force and rhythm; of fair strength; but slightly compressible. He does not suffer from any dyspnœa or palpitation. Physical examination of heart quite natural. Patient is very short-sighted. On ophthalmoscopic examination of the fundus of the eye, a large staphyloma posticum is observed on the *apparent* inner side of the optic disc; the vessels of the retina are also enlarged, and the choroid is found to be atrophied. By direct illumination the fundus is well seen; and when the observer moves his head in one direction, the retinal vessels appear to travel in the opposite direction. Patient is easily exhausted. Sleeps pretty well at night, and would rest better had he not to get up often to pass water. Occasionally he has frontal headache and attacks of giddiness.

Treatment.—The diet was as follows:—Breakfast: Porridge, milk, coffee, and bread. Dinner: Chop or steak, vegetables, broth, and bread. Tea and bread-and-butter in the evening, and milk at night.

June 2nd. Ordered one tablespoonful of decoction of jaborandi thrice daily.

Progress of case.—The following is a daily table of the amount of urine passed and the amount of fluid taken.

Date.	Amount of Urine passed in 24 hrs.	Amount of Fluid drunk in 24 hrs.	Notes.
June 1st	158 oz.	186 oz.	
,, 2nd	154 oz.*	156 oz.	Was up four times to pass urine. Bowels costive. Half an ounce of castor oil in the evening. Jaborandi commenced.
,, 3rd	150 oz.	156 oz.	Bowels moved freely after the castor oil.
,, 4th	120 oz.	146 oz.	Skin very dry; does not sweat at all. Dose of jaborandi increased to two tablespoonfuls. Bowels moved twice. Was up three times last night to pass urine.
,, 5th	140 oz.	146 oz.	
,, 6th	154 oz.	170 oz.	During night sweat a little about face and hands.
,, 7th	148 oz.	186 oz.	Sweat more. Dose of jaborandi increased to four tablespoonfuls three times a day.
,, 10th	100 oz.†	126 oz.	Sweat a great deal about face, but not on body.
,, 18th	110 oz.	116 oz.	Sweat profusely all over his body.
,, 25th	100 oz.	126 oz.	Saliva for last few days very much increased.
July 2nd	104 oz.	116 oz.	
,, 8th	100 oz.	106 oz.	
,, 10th	94 oz.	96 oz.	Sweat very profusely through the night. Saliva greatly increased.
,, 19th	100 oz.	106 oz.	
,, 22nd	98 oz.‡	100 oz.	Patient weighs exactly 9 st.

* Specific gravity 1008; albumen 1-8th; chlorides abundant; phosphatic.
† Specific gravity 1010; no sugar; albumen 1-6th.
‡ Acid; specific gravity 1010; albumen 1-10th.

These cases are interesting as showing the use of jaborandi in a disorder well known to be intractable. The action of the drug on the skin (probably *through the nerve-centres*) was well marked; the salivary glands were less *influenced.—Lancet, August 14, 1875, p. 242.*

SURGERY.

FRACTURES, DISLOCATIONS, AMPUTATIONS, AND DISEASES OF BONES, JOINTS, ETC.

28.—ON RECENT IMPROVEMENTS IN THE DETAILS OF ANTISEPTIC SURGERY.

By Joseph Lister, Esq., F.R.S., Professor of Clinical Surgery in the University of Edinburgh.

About three years ago my friend, Dr. Stang, of Sorweg, in Norway, being on a visit to Edinburgh, informed me that a new antiseptic had been discovered in Sweden, and was already extensively used in that country for the preservation of articles of food, and also as an application to wounds. The "aseptin," as it was termed, was in two forms, a powder and a liquid, the latter receiving the additional title of "amykos." The composition of the preparations was kept secret; but there was little doubt that they owed their virtue to one common ingredient; and he promised to send me samples of them, in the hope that they might prove useful in carrying out the antiseptic principle in surgery. This promise he at once fulfilled on returning home, at the same time telling me that the active principle of both the articles had been ascertained to be boracic acid, the virtues of which had been discovered by Mr. Gahn, a chemist in Upsala.

It happened that I was just then suffering from onychia of the little finger, attended with excessive fetor, and at the same time exquisitely sensitive, so that even a very weak watery solution of carbolic acid caused almost intolerable pain, while it entirely failed to subdue the pungent ammoniacal odour. I at once gave a trial to the amykos, using it just in the same manner as the former lotion, dropping some of the liquid upon the tip of the finger and wrapping it in lint soaked with the same fluid and covered with gutta-percha tissue. The drops of the amykos, as they fell upon the sensitive surface, caused not the slightest twinge of uneasiness; yet when I changed the dressing, after the usual interval, I was surprised to find an almost entire absence of fetor. Here, then, I had at once sufficient evidence that the new antiseptic, when employed in the form of watery solution, was both highly efficient and much less irritating than carbolic acid.

Boracic acid was then little more than a chemical curiosity. But I succeeded in obtaining in Edinburgh a sufficient quantity to enable me to test its properties unmixed with other ingredients. A striking instance of its antiseptic efficacy as well as of its therapeutic value was at once presented by a case of pruritus ani of upward of ten years' standing. The affected part was washed with a saturated watery solution at bedtime, and a small piece of lint soaked in the same solution was applied and retained during the night. The result was immediate relief from the accustomed irritation, and, what struck me as extremely remarkable, the bit of lint when removed next morning was free from smell. It was afterwards found that even the slight mechanical irritation caused by the presence of the lint might be avoided; for the mere application of a few drops of the watery solution last thing at night, the part *being left moist with* the liquid, proved completely efficacious; and this simple *treatment being* continued for a while, the obstinate tendency to irrita-

tion gradually disappeared, while the thickening of the folds of skin, which had been of several years' duration, entirely subsided.

Another example of the usefulness of the new remedy was furnished about the same time by a case of inveterate eczema of the ankles in a lady above the middle period of life. The water dressing which she used being removed, a very unusually fetid odour was exhaled from the moist scarlet surface which, tender as it was, she was impelled to scratch by an intolerable sense of itching. Thinking that here, as in the case of pruritus, the irritation caused by putrefaction might be a main element in the obstinacy and discomfort of the complaint, I gave the boracic acid a trial, substituting a saturated watery solution for the water in the dressing previously employed. The effect was at once to correct the fetor, but in this case the application occasioned a good deal of persistent uneasiness in the sensitive surface. The patient, however, persevered with the treatment, and in a short time the ankles were both in a sound condition, which I was lately glad to learn had proved permanent.

But, striking as were these evidences of the antiseptic virtue of boracic acid, I knew well that in the form in which I had hitherto tried it—namely, in lint soaked with a watery solution—it could not answer for a permanent antiseptic dressing under circumstances where there is at all a free discharge. For the putrescible fluid soaking into the lint would drive the antiseptic before it, and occupy its place, and as soon as this had occurred throughout the thickness of the dressing at any one point, putrefactive fermentation would be free to spread into the wound. In order that the dressing might be trustworthy it was necessary that the boracic acid should be in some way stored up in it, as carbolic acid is in the resin of the gauze, so that it could not be at once washed out from it by the discharge. A ready means of attaining this object was presented by the fact that the acid, though but sparingly soluble in water at ordinary temperatures, is pretty freely dissolved at the boiling point. Thus at 60° Fahr. water takes up only about a twenty-sixth part of its weight, and at 100° less than a sixteenth, but at 212° more than a third. Hence if a piece of lint is dipped in a saturated solution near the boiling point, it absorbs a great deal of the acid, and, after being allowed to dry, it is found to weigh about twice as much as it did originally, the weight of the crystals disseminated through it being nearly equal to that of the lint itself. If therefore this "boracic lint" is used as a dressing the discharge may soak through it repeatedly without dissolving out all the acid, although it takes up in its passage a sufficient amount to render it antiseptic. It is further a fortunate circumstance that the crystals of boracic acid, instead of being hard and harsh, like most crystals, are soft and unctuous, and therefore occasion no mechanical irritation of the skin.

The boracic lint has proved very valuable in the treatment of ulcers of the legs or elsewhere. In dealing with them, the first step is to cleanse the sore and the surrounding skin once for all from septic impurity. This is done by treating the surface of the sore freely with a solution of chloride of zinc (forty grains to the ounce), and at the same time washing the integument with a strong watery solution of carbolic acid, which is used on account of its remarkable power of penetrating the epidermis, while for the sore itself the solution of the chloride appears to be more efficient. This preliminary step having been taken, the boracic dressing is at once employed as follows :—A piece of oiled silk protective, of sufficient size to cover the sore and slightly overlap the surrounding skin, is dipped in the boracic lotion (a saturated watery solution) and applied, and over this a piece of boracic lint large enough to extend for an inch or more beyond the protective on all sides, the whole being retained in position with a bandage. It is well to soak the boracic lint with the lotion before putting it on, not for the sake of adding more of the acid, but because the lint, when applied moist and allowed to dry on, is less liable to slip afterwards from its position, and also for the purpose of purifying the surface of the lint itself, which in the dry state has no power of acting upon septic dust adhering to it, the acid which it contains being *non-volatile, and, therefore,* only acting when in solution.

In this dressing the protective serves its usual purpose of preventing as

much as possible the direct action of the antiseptic upon the healing part; and although boracic acid interferes with cicatrisation much less than carbolic acid does, the epidermic development proceeds more quickly when it is excluded, while the formation of pus due to the stimulation of the surface of the granulations by the acid (antiseptic suppuration) is of course diminished; and the less the discharge, the less frequently is it needful to change the dressing. The protective also keeps the surface of the sore moist, and so prevents the discharge from being pent up and causing inflammatory disturbance from tension, as is apt to be the case beneath the crust of inspissated pus in a dry dressing. The lint is also kept from sticking to the sore and tearing off the newly-formed epidermis when it is removed.

But it must always be remembered that the protective, in proportion to the efficiency with which it discharges its function of preventing the irritation of the acid, excludes also its antiseptic virtue, so that if putrefactive material exists beneath it any one point, the septic fermentation will spread over the whole sore. Hence the necessity for having the boracic lint to extend on all sides beyond the oiled silk, for if the protective were to escape at any one place from under cover of the antiseptic layer, it would necessarily conduct putrefaction inwards beneath it. Hence also the importance of adopting thoroughly efficient means of purifying the sore as a preliminary measure.

But if those points are attended to, this mode of dressing will be found to yield excellent results. The epithelial development, protected from needless disturbance, proceeds at a rate altogether unknown under water-dressing, and cicatrisation will often advance steadily in sores which, under ordinary treatment, cannot be got to heal at all; as when, through the unyielding character of surrounding parts, the shrinking of a large granulated surface has put the imperfect textures of the sore upon the stretch, and thus so reduced their vital power as to make them liable to ulceration or sloughing under the influence of stimuli which fail to arrest the healing of an ordinary vigorous sore, such as solutions of astringent salts or the degree of putrefaction that occurs in water-dressing within twenty-four hours. This application also saves trouble to the surgeon, for if properly used, it may be left unchanged for a period varying from two to five days, according to the amount of the discharge.

This last circumstance, together with the unirritating character of the dressing, makes it peculiarly useful for skin-grafting. The manner in which I have for a considerable time carried out Reverdin's beautiful principle is as follows :—The skin of the inner side of the upper arm having been slightly washed with 1 to 20 watery solution of carbolic acid to purify its surface, a thin layer of the integument is shaved off with a very sharp knife, so as to take barely more than the epidermis, scarcely drawing blood or causing pain. The little shaving is placed upon the thumb-nail of the left hand, moistened with a drop of the boracic solution, and bits not bigger than pins' heads are successively cut off and laid upon the surface with which they are to unite, by taking up each graft upon one side of the point of the knife and stroking the other side of the instrument upon the granulations so as to leave the graft behind. Care must be taken that the deeper surface of the graft is placed downwards, but this is readily done from the fact that the shaving always curls up with the deeper aspect on its concavity.

It is an interesting pathological fact brought out by this mode of procedure, that the surface of healthy granulations is as prone to adhere to freshly-cut perfect tissues as granulations are to coalesce with each other, or the sides of a recent wound to unite by first intention. The practice often followed of cutting beds in the granulations to receive the grafts, very inconvenient from the bleeding which it involves, is therefore wholly unnecessary. The several pieces of epidermis, of which twelve are furnished by a slice a sixth of an inch square, if simply applied to the uninjured surface of the sore, will probably be found to afford as many starting points for cicatrisation, *provided that the granulations* are healthy to begin with, and that all need*less irritation of the grafts* is avoided. As regards the former condition, it is

a great mistake to wait till healing has considerably advanced, and the sore has become already stretched and weakened by its own contractions ; and, as regards the latter point, the avoidance of needless irritation, the stimulus of putrefying materials must be got rid of by thoroughly purifying the sore as a preliminary measure, while the irritation of the antiseptic itself is reduced to a minimum by the dressing employed. In order to make sure against septic contamination during the process of grafting, it is well to cover the sore as soon as it is exposed with a piece of muslin dipped in the boracic solution, and uncover successive portions for the application of the grafts. Then, as each graft is put down, it is covered at once with a small piece of protective dipped in the lotion, and at the conclusion of the process, any parts of the granulating surface remaining exposed are covered in either by separate pieces of protective or by a general piece over the whole, as no harm is done by the layer being double. Boracic lint wrung out of the lotion, and well overlapping the surrounding skin, is then applied, two layers being used at the more dependent parts if the sore is large and much discharge expected, and a retaining bandage is put lightly on. This dressing is left untouched for two or three days; and when it is changed, all the protective will be found to come off as one piece adhering to the lint, but not sticking at all to grafts or granulations, which are covered with a layer of pus or lymph. This being free from putrefaction or any other irritating property, there is no need to wash the surface of the sore, a process which might disturb the grafts; but without any delay a fresh piece of dipped protective is applied, and over it the moistened boracic lint, any crusts of inspissated discharge on the surrounding skin being afterwards washed away at leisure with the lotion. When the dressing is next changed, the red ring of youngest cicatrix will probably be already apparent around each white epidermic islet.

The trifling wound on the arm which furnished the grafts is treated, like the sore, with protective and boracic lint, and, if these be properly secured, a scar will be found in its place when the part is exposed after the lapse of a few days.

To be able thus to treat recent abrasions with a single application, which may be left undisturbed for an indefinite period, is often a matter of great convenience, especially in the case which so frequently presents itself where such superficial injuries are present as complications of simple fracture. Here, without antiseptic management, troublesome sores are liable to form, requiring frequent disturbance of the splints to gain access to them for daily dressing. But after washing the part with (one to twenty) carbolic lotion, and applying the dressing of protective and boracic lint, the abrasions may be dismissed from further consideration.

It is, of course, essential for the success of this dressing that it should be kept accurately in position. In the case of abrasion in fracture this is probably insured by the presence of the splints, and in large sores upon the legs it is readily done by means of a bandage, especially one made of the antiseptic gauze, which, as before observed, is less apt to shift its place than a common cotton roller. But for small dressings in any situation, and especially about the face, where bandages cannot well be used, it will be found very convenient to fix the boracic lint by means of collodion applied to the edges of a piece of cotton cloth of open texture, sufficiently large to overlap the skin on all sides around the lint. The cloth used for making the antiseptic gauze answers the purpose very well, only it must be employed unprepared, because the resin and paraffin of the prepared gauze would prevent the ether of the collodion from evaporating. In absence of the unprepared gauze, a piece of ordinary rag may be used, if the edges are frayed out sufficiently to give the collodion a proper hold upon the skin.

The boracic lint may often be employed with great advantage as a moist application, soaked with the boracic lotion, and covered with gutta-percha tissue or oiled silk. Foul ulcers, coated with a layer of putrid slough or lymph, if dressed daily in this way, will probably soon assume healthy characters; and when this has occurred, a comparatively slight washing of the sore with *the chloride-of-zinc solution* will be sufficient for the final purifica-

tion, preliminary to using the dressing with protective and dry boracic lint; whereas if the chloride is used at the outset, while the sore is covered with its foul crust, a very energetic application is required, entailing hours of considerable uneasiness to the patient.

In deep burns, where from any cause the sloughs have been allowed to putrefy, the moist boracic lint will be found an excellent dressing. In a case lately under my care, the gluteal region having been extensively and deeply burnt, the vicinity of the perineum made it impossible to keep out putrefactive fermentation. Here accordingly a daily dressing of lint, steeped in one part of carbolic acid to thirty of olive oil, and covered with gutta-percha tissue, was employed; but, in spite of this application, the air of the room was pervaded with a strong putrid smell. I therefore substituted for the carbolic oil a dressing of moist boracic lint, and, at my next visit, was glad to find the apartment free from unpleasant odour, although, the sloughs having not yet separated, the emanations would doubtless have been even more offensive than before had the previous dressing been continued. I was, therefore, now able to direct that the boracic lint should be changed only every other day, instead of having the patient disturbed and pained by a daily dressing. And, further, when the sloughs had separated, feeling sure that, by virtue of the boracic acid stored up in the lint, putrefaction would be less advanced in three days under it than it would have been in twenty-four hours under water-dressing, I felt justified in allowing this still longer period of tranquillity.

This is a sufficiently striking illustration of the value of boracic lint as a moist application in all circumstances in which putrid sloughs are present in parts superficially situated, so that the antiseptic can gain access to them. And while the boracic acid gradually dissolved out of the lint by the discharges has this powerful effect in diminishing or arresting putrefaction, it also generally allows cicatrisation to proceed kindly in such parts as are already cleansed of sloughs, though the healing is not so rapid as where the direct action of the acid is excluded by protective over a purified sore.

If much inflammation is present around putrid sloughs, wet boracic lint applied to the sloughs, and a poultice outside this and extending over the whole inflamed integument, will be found to work extremely well. The boracic lint may be left undisturbed for twenty-four hours or more, while the poultice is changed as often as may be desired.

The moist boracic lint is a convenient dressing after operations upon the penis. Here the frequent exposure of the part for the purpose of micturition makes it necessary to entrust the antiseptic management on each occasion to the patient himself, so that some very simple arrangement is indispensable. With this object a strip of the moist boracic lint may be wound round the organ and secured in position by a piece of thread or narrow bandage, so as to cover the wound but leave the meatus urinarius free; and outside this permanent part of the dressing a loose piece of the wet boracic lint is wrapped and covered with gutta-percha tissue. Then at each time of micturition the patient removes the outer piece of lint, and readjusts it at the conclusion of the act, after pouring over the part a little of the boracic lotion. The unirritating character of the solution of boracic acid to mucous membranes, which is a peculiar feature of this antiseptic, prevents any inconvenience to the urethra from such treatment, which at the same time affords perfect security against putrefaction, yet allows healing to proceed kindly.

The most frequent case of operations in this situation is that for phimosis. It is now about ten years since it was pointed out by Mr. Furneaux Jordan, of Birmingham, that sutures are unnecessary after this operation, and that, after notching the narrow ring of the preputial orifice at one or more situations according to its tightness, and slitting up the inner layer of integument which embraces the glans, to a sufficient degree to permit free retraction, all that is required is to employ a simple dressing and to make a point of having the glans freely exposed once in twenty-four hours; the result being avoidance of the unseemly notch which the stitch, if it really answered its purpose, inevitably occasioned. Ever since the publication of this simple method I

have invariably followed it, and, as a rule, with great advantage; but not unfrequently the attainment of the object has been seriously interfered with by inflammatory swelling. But if putrefaction, which is the main cause of disturbance after this operation, is prevented by the boracic dressing, the œdematous puffiness of the prepuce, otherwise so apt to give trouble, is almost entirely avoided, provided that the incisions have been made sufficiently free to allow the utmost facility of retraction. It is, however, essential to the success of the antiseptic dressing that the organ should be thoroughly purified at the outset, as by washing the interior of the prepuce and the glans at the conclusion of the operation with saturated watery solution of carbolic acid (1 to 20), completely removing any portions of epithelial accumulation adhering about the frenum and corona. A narrow strip of the boracic lint is then wound round the neck of the organ and the retracted prepuce, with the object of keeping the parts in this position, except once a day when the skin is drawn freely forwards and again retracted. But if, as is often the case, there is an insuperable tendency of the skin to slip forwards, the permanent dressing may be dispensed with, the general covering of boracic lint being alone employed, with very free use of the lotion after each act of micturition, together with complete retraction once in twenty-four hours.

Boracic acid may be sometimes used with advantage in the form of an ointment, for which I would advise the following mode of preparation:—Take of boracic acid, finely levigated, one part; white wax, one part; paraffin, two parts; almond oil, two parts. Melt the wax and paraffin by heating them with the oil, and stir the mixture briskly along with the boracic acid powder in a warm mortar till the mass thickens. Then set it aside to cool, after which it will be found to be a pretty firm solid mass, which is to be reduced to the proper consistence of a uniform ointment by rubbing down successive portions of about an ounce each in a cold mortar. This ointment, when used, is spread very thin upon fine muslin or linen rag, which absorbs more or less of the almond oil and leaves a layer of blended wax and paraffin, flexible at the temperature of the body, and separable from the skin with the utmost ease by the discharge, which is thus not at all confined by it, but diffuses itself and flows out beneath it, receiving as it goes an abundant supply of the acid to prevent putrefaction, while cicatrisation is not materially interfered with by the mild antiseptic, and still less by the perfectly bland wax and paraffin.

A good example of the value of the boracic ointment was presented by a case of large rodent ulcer of the face lately under my care in the Edinburgh Infirmary, and treated by excision. The disease involving a large extent of the cheek, both eyelids, both nostrils, a considerable portion of the upper lip and part of the lower one, it was impossible to cover the raw surface by a plastic operation. It was therefore of great importance that efficient antiseptic means should be employed; for there is no more simple or more striking illustration of the value of this principle of treatment than the entire absence of inflammatory disturbance around an open wound when putrefaction is really prevented from taking place in it; the "stimulus of necessity" of John Hunter being, in truth, simply the stimulus of putrefying substances, so that the danger which usually attends open wounds is entirely avoided by efficient antiseptic measures. But whatever might be the material employed for this purpose, it was inadmissible to interpose a protective layer between it and the raw surface; for this would simply have had the effect of conducting septic fermentation over the entire wound from the sources of putrefaction present at the mouth and nostrils. Seeing, then, that the antiseptic must be applied directly to the divided tissues, it was of course desirable that it should be as mild as possible consistently with its efficiency; and for a situation like this the boracic ointment was much better adapted than the moist boracic lint, the fine cloth spread with it applying itself with facility and accuracy to the irregularities of the surface, and keeping its position without any retaining means except a packing of unprepared gauze applied over it to absorb discharge, and retained by a bandage of the same light material.

The eyeball, left bare by the operation, was protected from contact with the dressing by having the loose skin above the upper eyelid drawn down over it by means of the "button suture," as I may term a form of "stitches of relaxation," which I have used for nearly two years with great advantage. It consists of two oval pieces of sheet lead, about one-twentieth of an inch thick, with a central perforation to receive a moderately thick silver wire. The silver wire is first passed as an ordinary suture, except that it is carried at an unusually great distance from the edge of the wound, both as regards surface and depth; each end of the wire is then passed through the hole in the corresponding lead button, and secured by being wound once round the shorter diameter. The two buttons thus take the place of the tips of two fingers of the two hands in giving support to the deeper parts of the wound, while leaving the cutaneous margins entirely free; and when the wound is at all extensive several pairs of buttons are applied in this way, constituting a sort of interrupted quilled suture. By their means the lips of a wound which otherwise could not be got to meet without considerable tension will often lie in contact of their own accord, any number of superficial sutures being added that may seem desirable to keep the edges of the skin in accurate apposition with a view to primary union.

The larger the surface which the buttons present to the skin the greater is their hold upon it, and the less, consequently, is their liability to glide and allow the wire to cut through the tissues by ulceration. When the circumstances of the wound allow them to be used, as after the removal of the mamma, it will probably be found, when they are removed after the lapse of a week or ten days, that the buttons still occupy precisely the same situations that they were originally placed in, the surface beneath them being slightly depressed, but, in consequence of the diffusion of the pressure, not ulcerated, and this even in cases in which, a large amount of skin having been sacrificed, they have been made to exercise a degree of traction which without experience would seem inadmissible. But much smaller buttons, though less perfect in their action, will often be found of great value in small wounds, as, for example, after the operation for hare-lip, where they take the place of strapping, but work much more effectually and also much more conveniently, as they leave the cutaneous margins free from compression and open for inspection. Here, indeed, at the upper part of the wound the small size of the buttons is attended with little disadvantage, because, being applied to the alæ of the nose in planes nearly perpendicular to the direction of the wire, which perforates the tissue deeply below the septum narium, they cannot glide at all upon the surface, but, retaining their position perfectly, prevent in a very satisfactory manner the stretching of the united tissue at the nostril which is so prone to occur under strapping. In this particular situation, therefore, the only disadvantage of the necessarily small size of the buttons is that, their pressure being concentrated on comparatively small portions of the skin, they will be liable to cause patches of superficial ulceration if the traction upon them should became increased by inflammatory turgescence. But if this threatens to occur, either in this particular wound or in any other, the difficulty is readily got over by unwinding the wire from one of the buttons, and, after straightening it, allowing the button to slip upon it to any degree to which the tension disposes it, and then fixing it again by winding the wire round it. And, conversely, if the support of the buttons is still required after they have become slack from any cause, they can be braced up at pleasure to any requisite degree.

Even when the edges of the wound cannot be made to meet at all, the extent of the exposed tissues and consequent granulating surface and cicatrix may be greatly reduced by the use of the button stitches, as was illustrated by the case of rodent ulcer which we are considering, where a single pair of buttons being applied, one to the skin above the eyelid and the other to that over the lower border of the jaw, the connecting wire lying exposed on the raw surface, the integument thus drawn down formed a permanent covering for the eyeball.—*Lancet, May* 1, 22, *and June* 5, 1875, *pp.* 603, 717, *and* 787.

29.—DEMONSTRATIONS OF ANTISEPTIC SURGERY.

By Joseph Lister, Esq., F.R.S., Professor of Clinical Surgery in the University of Edinburgh.

[These demonstrations were made before the British Medical Association in the Operating Theatre of the Royal Infirmary, Edinburgh, in August 1875. The first case was one in which Prof. Lister proposed to lay open the knee-joint.]

I need hardly remark, that to do this without antiseptic treatment would be madness—would be a thing which no surgeon would be justified in doing; to make a free incision into the knee-joint and to keep the wound open with a drainage-tube, would be an altogether unwarrantable procedure. We all know that the knee-joint has often been opened by free incision for the extraction of loose cartilages, and that in some such cases, the wound having healed by first intention, all has gone on well without any antiseptic treatment at all; though we know also that this is a very uncertain and dangerous practice. But though it is true that wounds of joints, whether accidental or intentional, may heal without disturbance under ordinary treatment, yet it is certain, that if such wounds were kept open without antiseptic means, disastrous consequences would be inevitable; by keeping the wound open we should take away the only chance there would be, without antiseptic treatment, of the case ending without disaster. But, paradoxical as it may at first appear, with antiseptic treatment the more free the wound, and the more widely it gapes, the more certain you are to avoid inflammatory disturbance in the joint; simply for this reason, that you are the more certain of a free discharge of the plasma effused into the interior. And if you avoid all tension from this cause, and at the same time exclude putrefactive mischief, you have the joint left absolutely free from irritation. Before we bring the patient in, I may say that I shall make the incision pretty free as regards the skin, and carry it gradually down to the joint, so as to be able to see and secure any small artery that may be divided. For if you simply plunge the knife into the joint, and put in a drainage-tube, bleeding may take place into the articulation from some deep vessel, and lead to considerable inconvenience. Just as in Professor Andrew Buchanan's well known experiment, hydrocele fluid is made to coagulate by the addition of a little serum from a blood-clot, so if a very little blood finds its way into the knee-joint, the liquor sanguinis effused from the synovial surface mixing with the globulin of the red corpuscles forms a coagulable fluid and undergoes coagulation, and you have the knee-joint filled with solid matter, which interferes with the rapidity of recovery, although in due time the accumulation disappears by absorption.

[The patient being now brought in, Mr. Lister proceeded.] Here, then, we have before us the distended knee-joint. You observe this peculiar limited special bulging, which, together with the history, makes me suspect that the joint is on the eve of suppuration.

I have said that this case will be an example of the antiseptic treatment in its simplest form. The antiseptic will not be introduced into the joint; it will not be applied to the affected part at all. It will be merely employed externally to prevent the access of septic mischief while we provide exit for fluid from the interior. We shall first purify the skin with a strong (1 to 20) watery solution of carbolic acid, which is best for detergent purposes; water holding carbolic acid but slightly, and very readily giving it up to act upon anything else. Carbolic acid has a remarkable penetrating property. It blends with oily substances and animal matters, and penetrates the hair and hair-follicles, and therefore such a washing as I am now giving will render the skin absolutely pure, surgically speaking. This is a very great point.

In the next place, we shall have an antiseptic atmosphere provided by means of this spray-producer, which acts on the principle of Siegle's steam inhaler. High-pressure steam, issuing by a minute orifice from a boiler heated by spirit-lamp or gas, sucks up a strong solution of carbolic acid by a tube that *dips into a vessel containing* it, and, blending with it in about equal *quantity, forms a 1 to 40 spray.*

The part to be operated upon, then, being in an antiseptic atmosphere, if the finger is to be introduced into the wound (and I shall very likely have to pass my finger into the joint) you must take special care that it is an aseptic finger; and this is done by cleansing it with an antiseptic solution, making sure that it passes well into the folds of skin about the nail. And if I should have to introduce an instrument into the articulation, I must see that it is always pure when inserted.

I am more and more persuaded, the longer I practise antiseptic surgery, that the chief essential to success is a thorough conviction of the reality of the presence of the septic matter on all objects in the world around us.

[Mr. Lister then proceeded to perform the operation. Some small arteries, which bled in the incision, were secured with fine prepared catgut, and the joint having been opened, two drainage-tubes, each about ¼ inch in diameter, were inserted side by side; an obstructing band within the articulation being divided by a probe-pointed knife guided by the finger so as to permit them to be introduced fairly into the cavity. He commented on the various steps as he proceeded, urging again the absolute necessity of having all the instruments thoroughly aseptic, and went on to say]—One learns after a while to do these little purifications instinctively, but at first it requires thought, intelligence and constant care, particularly to any one who has been in the habit of operating without having to attend to these minutiæ. Would that we could get rid of all complications in the system! If we could dispense with the spray, no one would rejoice more than myself; but until somebody wiser than I am can supply some better means, we must continue to use it. There is, I find, considerable thickening of the textures in the vicinity of the joint, and this is the cause of the swelling which is still apparent, though the synovial capsule is now empty. The outer orifices of the drainage-tubes are made transverse or oblique, as required, in order that they may lie flush with the surface of the skin, and when retained in this position by means of the threads which you see attached to their margins, they discharge their functions perfectly.

The operation having now been performed, the next point is so to dress the wound as to make sure that nothing septic will get in before next dressing; this must be not a matter of hope but of certainty. The material which we have used for some time past is an open cotton cloth, with the fibres impregnated with a mixture of carbolic acid and common resin. Common resin holds carbolic acid with extreme tenacity, and in consequence of this gives it off so slowly as to be unirritating to the skin; yet at the temperature of the human body it furnishes a sufficient supply of the acid for a trustworthy antiseptic dressing. But at the ordinary temperature of the air in this country, the antiseptic is evolved so slowly from the gauze that the fermentative energy of septic dust is not at once extinguished by falling upon it, as it is by mingling with a strong watery solution; and if the gauze were applied dry, some active septic particle, adhering to its surface, might enter the blood or serum at the outlet of the wound, and propagate putrefaction to the interior. There was a time when I used to have occasionally in my practice putrefaction which I could not explain, but which I afterwards saw must be due to this cause, and the difficulty was then at once overcome by dipping the lowest piece of gauze in a watery solution of carbolic acid. This solution which I am now using, having been mixed with blood from the wound, has a very dirty appearance. A surgeon, who went round my wards some time since, expressed astonishment that I should use dirty lotion to wash a wound, and to purify what I was placing upon it; but the wound, although æsthetically dirty, was surgically pure, and the lotion had not been made impure by being used for washing it. Even if it had been otherwise, we might have trusted the carbolic acid to purify it. Why then should we waste good lotion? I dip, therefore, in the lotion this piece of gauze that I place next to the wound, and thus make perfectly sure that nothing septic is applied to it.

It is most important that the spray be properly directed during the dressing. *I have seen a surgeon* expose a serious wound, involving injury to the *brain, while the spray was only* playing on the opposite side of the head. It *were far better that the* antiseptic method should not be employed at all than

should be used imperfectly. For such attempts not only end in dis-
ment, but throw discredit on the system. Some people seem to say,
ve tried the thing and failed, and therefore, of course, the system is all
se." I have seen it fail in my own practice, but under such circum-
s I have aways thought that there must have been some mistake on my
nd I have endeavoured to discover where my mistake lay. But that
ot seem to be the way in which the matter is viewed by some of our
sional brethren.
mall piece of the gauze dipped in the lotion having been placed next
und, the dressing on which we rely for excluding putrefaction is ap-
in the form of eight layers of the gauze, sufficiently broad, as you see,
er the surrounding skin for several inches in every direction; and be-
the outermost layer is placed this piece of thin Mackintosh cloth to
nt the discharge from going directly through the dressing; because, if
siderable quantity went through, strongly as the resin holds carbolic
it might be all washed out before twenty-four hours had elapsed, and
putrefaction would spread inwards to the wound. The dressing is se-
by a bandage, for which strips of the antiseptic gauze prove very con-
nt. Now we are perfectly sure, that if we have left nothing septic in
ound, we shall find no putrefaction when the dressing is changed to-
ow.
he subsequent progress of this case has illustrated well the remarks
e at the demonstration, with regard to the effects of a free opening, or
ontrary under antiseptic management. When I saw the patient on the
wing day, I learned that he suffered unusual pain in the afternoon after
peration, which became very severe during the night, and though some-
less in degree at the time of my visit, was still very considerable. The
erature had risen on the previous evening to 102.4° F., and was now
9°. Such a state of things would at one time have alarmed me, and
ld have made me fear that putrefaction had occurred. This, however, I
confident could not have been the case, and another probable explanation
ested itself. The peculiar bulging above alluded to, situated over one
he pouches of the synovial capsule beside the ligamentum patellæ, had
ted me to make the opening in that situation; but the bulging part col-
ng on escape of the fluid, the only way in which I could ensure complete
oduction of the drainage-tubes into the joint was by passing their ends
er the ligamentum patellæ; and I thought it not unlikely that they might
been compressed, and their function so interfered with. Accordingly,
changing the dressing, I found that the gauze presented a bloody stain,
ch appeared sufficiently accounted for by oozing from the surface of the
nd, while the joint was fully distended. And it appeared that the dis-
ance to which the articulation had been subjected had led to unusually
id effusion from the synovial surface, and this being unable to escape, had
duced great tension, attended with pain and fever. I at once placed
under chloroform, and made a fresh incision at the outer side of the
b into the pouch above the patella, and introduced a drainage-tube larger
diameter than the little finger, after pressing out the clear serous and
inous contents of the capsule. This was of course done with antiseptic
cautions, and a dressing like that employed the day before was applied.
e result was that almost immediately after awakening from the chloroform
ep, he felt himself entirely relieved of his pain; and not only has that
ich was induced by the first operation left him, but he has entirely lost
at which had annoyed him for so long a period previously. The tempera-
re in the evening was found to have fallen to 99° F., and has since remained
rmal, and the discharge, which has continued to be merely serous, has
diminished in quantity, that when I last saw him (15th August,) I substi-
ted a drainage-tube of medium size for the large one, and was able to di-
ct that an interval of three days should be allowed to pass before the next
essing. I must add, that he has tested the limb, contrary to orders, by
tting out of bed and resting his weight upon it, but without any of the
in which he formerly experienced on so doing. In all other respects he is
perfect health.*]—*Edinburgh Medical Journal, Sept.* 1875, *p.* 193.

*Mr. Lister brought other interesting cases forward to show the value of this treatment.

30.—ON SUPRA-CONDYLOID AMPUTATION OF THE THIGH.

By Dr. WILLIAM STOKES, Professor of Surgery, Royal College of Surgeons, Ireland.

I deem the following cases worthy of record, not only on account of the clinical interest attached to them, and the results which were obtained after supra-condyloid amputation, but mainly because I believe these results will tend to confirm the high opinion that is held of that operation by all surgeons who have performed it. These reasons induce me to draw attention again to the advantages which I consider may be claimed for the procedure—advantages which render it, in my opinion, decidedly preferable to the knee amputations of Velpeau, Syme, Gritti, and Carden, and also to the operation of excision of the knee-joint, being attended with far less risk to the patient than that procedure—one which is ever fraught with the greatest peril to those on whom it is performed, and, notwithstanding the enthusiastic but, I think, extravagant praise that at times has been lavished on it, a mode of proceeding, disappointing in its results, and inferior to the operation I now advocate.

Case 1.—Michael W., aged twenty-eight, by occupation an ironmonger, was admitted into the Richmond Surgical Hospital, under my care, on the 8th of last August. The first appearance of the disease from which he suffered—necrosis of the upper third of the tibia, preceding chronic synovial inflammation of the knee-joint—was in the year 1870. The patient stated that in that year several pieces of bone came away through various sinuses situated on the anterior and internal aspects of the upper portion of the shaft of the tibia. In the following year the knee became affected, and two years subsequently amputation was suggested to him, but at that time he would not consent to the operation proposed. He then came up to Dublin, and was admitted into the Richmond Hospital. At the time of his admission the sinuses I have already spoken of had healed, and what appeared chiefly to call for surgical treatment were the synovial effusion and thickening. For some time I entertained the hope that by rest, vesication, iodine, and the internal exhibition of anti-strumous remedies, I might possibly succeed in saving the limb. I accordingly put the limb up in a gypsum bandage, adopting the Bavarian method, which has been so strongly advocated by my colleague, Dr. Corley, and followed out the treatment I have already alluded to, the details of which need not be discussed. This I continued for nearly two months, and then finding that no improvement had take place, but rather the reverse, the sinuses having re-opened and revealed the existence of extensive osseous disease, I recommended amputation. As there was no evidence that the disease had involved either the patella or lower end of the femur, the case appeared to me adapted for supra-condyloid amputation of the thigh, and, assisted by my colleagues, Mr. Hamilton, Dr. Thomson, and Dr. Thornley Stoker, this operation I accordingly performed on the 7th of last October, Esmarch's bandage having been applied, and chloroform administered. The operation was as bloodless as it was painless, and I may mention here an observation made by my late revered colleague, Professor Adams, on this occasion. "It is the first time," he said, "in which I have witnessed an amputation of the thigh during which the patient did not give a single moan, or lose a single drop of blood!" As regards the steps of the operation, I may mention that, save in one particular, to which I shall presently allude, I followed rigidly the rules mentioned in former communications on this operation made to the Medico-Chirurgical Society of London and the Surgical Society of Ireland. As regards the progress of the patient after the operation, there was nothing noteworthy, except that the union of the wound was exceptionally rapid.

To Professor Velpeau is undoubtedly due the credit of first pointing out the advantages to be derived from amputation at the knee. Among these may be mentioned that the weight of the body can be placed on the face of *the stump*; that the hip-joint preserves all its movements, the patient not being obliged to walk as if the hip-joint were ankylosed; and that the shock is not so great as after the ordinary amputations of the thigh.

The modifications of this operation, introduced by Professor Syme and Mr.

Carden, were the next that were introduced into surgical practice, and subsequently the modification of Carden's operation, which is known in Continental schools chiefly as Gritti's amputation; and, lastly, the operation which is the subject of this communication.

I may briefly state the advantages that I think may be claimed for supra-condyloid amputation, which name I have selected in order that surgeons should bear in mind the necessity of making the femoral section *above*, and not through, the condyles, as in Syme's, Carden's, and Gritti's amputations. These advantages are those which it has in common with the other amputations at the knee and those which are peculiar to itself. Among the former I may mention :—

1. The stump being more useful for progression in consequence of the possibility of making pressure on its extremity, and the patient not being obliged to walk as if he had an ankylosed hip-joint, as is always the case when the point of support is at the pelvis. As Dr. Markoe says:—"To the poor man this single circumstance makes all the difference, between his being able to earn his living by active employment and his being laid up for life a hopeless cripple. To the rich man who is able to secure the aid of an artificial limb, it makes the difference between a point of support at the knee and a point of support at the ischium. In fact, it is practically the difference between amputation below and amputation above the knee."

2. The diminished liability to the formation of tubular sequestra.

3. The operation is less hazardous, being further removed from the trunk than the ordinary amputations of the thigh.

4. The shock is less than in the higher amputations, as the muscles which are divided are few in number, and being cut, not through their fleshy bellies, but at their tendinous extremities.

5. Less liability to suppuration.

6. Less liability to osteo myelitis, from the medullary membrane not being interfered with.

The special advantages of supra-condyloid amputation are—

1. That the posterior surface of the anterior flap is bound with a natural synovial lining, which I feel confident largely diminishes the chances not only of subsequent exhaustive suppuration, but also of purulent absorption.

2. Any possibility of the split patella shifting from its place on the cut surface of the femur is prevented by the high femoral section, and by stitching the two bones together in the manner I have described.

3. The existence of an osseous curtain, which is formed by the split patella covering the cut surface of the femur, diminishes probably the chances of pyæmia, and is not liable to slough away as the periosteal curtain as recommended by Von Langenbeck undoubtedly is.

4. The vessels are divided at right angles to their continuity, and not obliquely, as they are in other flap operations.

5. The existence of a posterior flap diminishes the chances of any wide gaping of the wound posteriorly, while the anterior flap, being oval, increases the chances of the stump tapering gradually towards its extremity, and assuming the form of a rounded cone.

6. The preservation of the normal attachments of the extensors of the leg.

To Professor Velpeau is due the credit of first recommending the preservation of the patella in amputations at the knee-joint, and this recommendation was adopted subsequently by Lane, Blenkins, and Markoe. To Gritti is due the credit of drawing attention to the fact of the great advantage that is derived from having the patella fixed, in order that there should be a firm standpoint on which the extensors may act. The operation, however, as practised by him, was in many respects a defective procedure, was attended, as Prof. Rizzoli informs us, with a high rate of mortality, and consequently soon fell into disrepute.

In supra-condyloid amputation, which is the outcome of the procedures I have alluded to—notably those of Velpeau, Syme, Carden, Gritti, and Rizzoli—I have retained the advantages observable in these operations, and eliminated what *experience has shown* to be defective in them, and the result obtained *in my hands, and in those* of my colleague, Professor Macnamara, and

the other eminent surgeons who have performed the operation, lead me to the conviction that it must be conceded that, in supra-condyloid amputation, a signal advance has been made in operative surgery. It is a source of much gratification to me to be able to state that Mr. Wheelhouse, one of the eminent surgeons of the Leeds Infirmary, considers that supra-condyloid amputation possesses "advantages which render it *decidedly superior to any other known method of amputation of the limb*, and which render its adoption almost, if not quite, imperative." This opinion was given in 1872; and wishing to know in what estimation the operation is still held in Leeds, I wrote to my friend Mr. Jessop, one of the first, if not the very first, who practised the operation in England, and he observes:—"The supra-condyloid amputation fully maintains its repute here; I see no reason whatever to alter the opinion I expressed to you some time ago as to its merits. Whenever a suitable case presents itself, I prefer it (the supra-condyloid) to Carden's, as well as to *all other forms of amputation* in the immediate neighbourhood of the knee-joint."

Every surgeon to whom I have shown the results I have obtained by this procedure has borne evidence as to the great shapeliness of form in the stumps, their appearance, and remarkable applicability for the adjustment of prothetic mechanical appliances. In truth, of the amputations in the neighbourhood of the knee-joint, supra-condyloid amputation undoubtedly affords the most satisfactory results; and, more important than all, is the operation of its kind which is attended with the minimum of risk to the patient's life.—*Dublin Journal of Medical Science, August* 1875, *p.* 97.

31.—ON THE TREATMENT OF FRACTURES OF THE LOWER EXTREMITIES.

By James Spence, Esq., F.R.S.E., Surgeon in Ordinary to the Queen in Scotland.

Looking at some of the more prominent recent changes in surgical practice, a superficial observer might almost imagine that instead of progressing, our science moved in a cycle; and were he inclined to be cynical, he might suggest that we had revolved back to the period of sheer mechanical forces, complicated dressings, and red-hot knives. A nearer and more appreciative examination will show us, however, that even in cases where the principle is not new, the method of applying it has been so modified and improved as to constitute a real advance and addition to our resources. Let me take, as an example of this, a method of treating fractures of the lower extremity now much used—extension by weight and pulley.

The great tendency to shortening and deformity in cases of fracture of the thigh-bone, owing to the contraction of the powerful muscles which surround it, could not but attract the attention of those called upon to treat such injuries; and hence, from the earliest times, surgeons were naturally led to try and overcome the displacing causes by opposing force to force by means of *extension* and counter-extension. The principle of extension is now almost universally admitted to be best in these fractures; but the method by which it is applied makes all the difference. Those who first applied the principle seem to have had in view rather what mechanical forces could effect, than what the living body could bear. You have only to look at the formidable machinery they employed for the purpose, such as the bed of Hippocrates, the "organon," and the various forms of glossocoma,—different kinds of racks and windlasses, in fact,—to understand how a revulsion of feeling in the profession should have at one time led to the abandonment of the extension treatment in fractures of the thigh-bone, and to the adoption of the method of laying the limb on its outside, with the leg bent on the thigh, and *the thigh bent on the* pelvis—a principle of relaxing powerful muscles which *had proved most useful in* fractures of the leg, but which, for obvious causes,

proved most disastrous in those of the thigh. The abuse of a power is not a reason for abandoning its use: we would do better to examine into it, and try whether it be not capable of improvement. I fear, however, human nature has a bias to extremes; and so we often miss making improvements on methods of treatment until they suddenly reappear as novelties, and are accounted, and properly so, as marks of progress. Mr. John Bell, in his great work on Surgery, speaking of the machines used in treating fractures, says: "I may, perhaps, do you some service by explaining the simple principles of this department of surgery; and then you will be able to enter the magazines of Scultetus, Hildanus, and Parceus, filled with engines not unworthy of the chambers of the Inquisition, without being tempted to bring out along with you any of their lumber." Accordingly, he does enter the magazines of apparatus, and criticises them with his usual scathing sarcasm. Amongst other "lumber," he unhangs from the walls of the magazine of Hildanus a weight with circle and strap for hanging from the ankle, and drags to light a bed with a surcingle or perineal band of horse-girth for fixing the body to the upper part of the bed; and on this rude apparatus for permanent extension he makes ironically laudatory remarks. Mr. Bell would have been better employed if, when he exhibited the rude apparatus of Hildanus, and admitted its power of maintaining permanent extension, he had thoughtfully considered how it might be modified so as to get rid of its defects, and be converted into a simple and effective means of treating fractures of the lower extremity. Let me again take the dust off this bed and weight of Hildanus, and place them alongside some modern surgical upholstery, and see how like they are. Here is the weight and pulley method copied from a recent work on surgery. How very like! The perineal band or surcingle fixing the patient; the weight hanging from the foot through the pulley fixed at the foot of the bed. But how is the weight hung from the limb? No longer by a circular strap round the ankle, acting on one part only, and so unendurable, but to long plasters fixed to and embracing a great breadth of the limb from immediately below the fracture, and so diffusing pressure that the patient feels no inconvenience, and is scarcely sensible of the extending force. That makes the difference. But something is still wanting to its perfection. Can we get rid of that perineal band, which proves so troublesome to patient, and surgeon, and nurse? How can we dispense with it, and maintain a counteracting force to the extension from the foot? Tilt up the lower end of the bed; place blocks of wood below the feet of the bed; take off the perineal band, and let the body be the counter-extending force; and there you have the simplest, least irksome, and most perfect method I know of treating fractures of the thigh, and, if possible, still more useful in treating oblique fractures of the tibia.

Until a comparatively recent date, I seldom used anything but the long splint for the purpose of extension and counter-extension; and several years ago I drew special attention to what I considered essential to its proper use—viz., maintaining a moderate amount of extension during treatment, more especially when the fracture was oblique; and, so far as the results of my practice were concerned, I had little reason to abandon the long splint for any other method. But it is impossible for any one who has had much experience in its use not to feel that it had defects, and that much care is required to prevent troublesome results, and to overcome some difficulties. I may mention, for example, the tendency to fretting and excoriation of the soft parts caused by the perineal band or extensor, and by the handkerchief which was generally used for fixing the foot to the splint. Nay, unless great attention was given, the pressure of the handkerchief sometimes gave rise to sloughing, especially in old or very young patients. Indeed, for some years before I began to use the pulley-extension, I had used plasters as the means by which I fixed the foot to the lower part of the splint, so as to obviate the bad effects of the handkerchief round the ankle and instep, and also as maintaining extension in a more direct line, and preventing any eversion of the foot; and I would strongly urge this modification whenever the long splint is used. But there still remained the inconvenience and irritation caused by *the perineal band, and* the frequent necessity of changing it for

cleanliness; and when this band is removed, of course all extension and counter-extension cease for the time, unless kept up by assistants; and there is risk of displacement occurring. Another troublesome, though less serious, effect was the stiffness of knee when the splint was removed at the end of six or seven weeks; and, in some patients of rheumatic diathesis, or those who would not tolerate early passive motion being used, I have known a considerable amount of stiffness remain for years. I confess that my predilection for, and my favourable experience in the use of, the long splint, made me very unwilling to abandon it; but, having to treat a compound fracture of the thigh where the wound was so placed that even the bracketed long splint could not be used, I tried the extension pulleys, and found that method so effective, that I tried it in ordinary cases, and have found it so simple and effective, so much more comfortable for both patient and surgeon, that I now rarely use the long splint—almost never, except for clinical instruction, that students may see more than one method of treatment. Now, after some years' experience in the use of the extension-pulleys in fractures of the thigh in very young children and in adults, in fracture of the neck of the femur in old persons, and in long oblique fractures of the tibia, I unhesitatingly commend the method to all who may not have tried it. Of course, in fractures of the shaft of the femur, lateral splints are required, just as when we use the long splint, and also for lateral support in fractures of the leg. When there is much bruising, however, I merely use sand-bags to prevent lateral displacement; and I also prefer deep sand-bags to prevent rolling of the limb outwards in fractures of the thigh, to a long lateral splint, as used in America. In fact, the full advantages of the extension-pulley method are only secured when we abandon the perineal *lacque* and long lateral splint, and make the body the counter-extending force.

Looking at the extension method, as thus improved and simplified, I think we may fairly reckon it as progress in a most important department of surgery; but whilst we congratulate ourselves in our advance, and replace the bed and weights of Hildanus in the *armamentarium antiquorum*, let us regard it not as "lumber," but reverently with the homage due to the perception of a true principle, however rude in design and execution the apparatus may be.

The use of plasters, as enabling us to fix apparatus, is capable of numerous applications; and in transverse fractures of the patella I have used it with advantage to enable me to approximate and retain the fragments, by means of Malgaigne's hooks, without penetrating the skin.—*Medical Times and Gazette, Aug.* 21, 1875, *p.* 204.

32.—OPERATION FOR UNUNITED FRACTURES.

By Dr. Matthew Hill, Liverpool.

This operation is a modification of Dieffenbach's, which consists in cutting open the fracture and then inserting ivory pegs into the bone, with the object of exciting such an amount of action therein as will result in the throwing out of reparative material to be afterwards developed into callus. Before describing the operation, it is desirable to take a cursory review of the different methods—and their name is legion—which from time to time have been adopted to cause bony union in these obstinate cases. These measures may be conveniently classed under three heads: First, those which do not alter the fracture from its simple or unexposed condition, such as blisters, stimulating embrocations, friction of the fragments against each other, malleting the fracture externally, and subcutaneous scarification of the bone ends. In the second class may be included such proceedings as may be called *transitionary*, that is to say, while they cause some slight communication of the fracture with the external air, and are often accompanied by suppuration, yet do not absolutely expose the bone; such are the setons, cauteries—actual and poten-

tial, and the steel skewers and screws which have been used to transfix the fragments, but project through the flesh. Lastly, in the third class must be placed those operations which, to all intents and purposes, render the fracture "compound," such as Dieffenbach's, and the various plans for resection with or without subsequent wiring together of the denuded bone ends. Any and all of these proceedings require to be aided by some immovable form of apparatus which shall fix and steady the limb—for in the limbs alone is interference required. It is obvious that any procedure which shall convert the dangerous and tedious, but mostly effectual, remedies of the third class into the safer category of the first class, should be an acquisition to surgery, and this is what the new operation purposes to effect. Of course it is understood that the more severe and radical operations should be deferred until the milder ones have been tried and failed; but in many instances, especially in the femur and humerus, it is "advisable not to employ the seton, but to pass on at once to Dieffenbach's plan," as being attended with less danger. In Dr. Hill's patient the femur was fractured ten weeks before coming under his care. Powerful grating of the fractured ends together was then tried, but produced no result; a like want of success followed subcutaneous scarification. Dieffenbach's method being next determined on, the author conceived the idea that it could be done subcutaneously, thereby avoiding the tedium, trouble, and danger of a large and deep wound. The necessary tools are an Archimedian drill-stock, a steel drill four or five inches long, and a few ivory stilettes of the same length and diameter (or slightly tapering) as the drill. The drill and stilettes are similarly graduated in half-inches, and the ivories are, moreover, grooved like a director, in order to slide along the drill. The *modus operandi* consists in entering the drill through a puncture made by a tenotome down to the bone; the depth of the soft parts is now read off by means of the graduations, then if it be desired to bore into the bone to the depth of an inch, the drilling is proceeded with until the steel has penetrated an inch further than the original reading. The ivory stilette is now filed *halfway through* an inch from the point, and after being soaked in carbolic oil is guided by its groove down along the drill to the brink of the perforation in the bone, from out of which the steel is next lifted, the ivory slipped into its place, hammered, and by a smart lateral motion broken off at the filed notch. The operation is completed by withdrawing the remainder of the stilette and sealing the puncture with a bit of lint and plaster. Thus an inch peg is accurately placed in an inch hole, leaving no portion projecting into or from the flesh. The graduations on the ivory are for the purpose of comparison with the depth indicated previously on the drill, and it should be observed that the readings tally before the stilette is broken off. The reason why the stilette is grooved instead of the drill is that when the peg is driven home a channel is thus provided for the escape of inflammatory fluids, which would otherwise be pent up in the bone. By the means first detailed three pegs were successfully inserted around the fracture—one in the upper and two in the lower fragment; the punctures healed kindly in twenty-four hours without the development of pus or any constitutional disturbance; even the local irritation was far less than expected or desired. Whether the result to the patient be successful or not, the practicability of subcutaneous pegging has been safely demonstrated, and it should be borne in mind that in the event of diffuse inflammation or abscess supervening in any other case, requiring the fracture to be laid open, the patient is only in the position which Dieffenbach's mode of operating has hitherto necessitated.—*Medical Press and Circular, Sept.* 5, 1875, *p.* 210.

33.—REMOVAL OF THIRD METATARSAL BONE: ANÆSTHESI BY CHLORAL-HYDRATE.

By G. J. S. Nairne, Surgeon, and Alex. Nairne, Physician, Glasgow.

On April 1st, 1875, Christina D., aged 3½, a delicate-looking girl, wa put under the influence of chloral, and had the third metatarsal bone of he left foot removed for disease. The operation had nothing special to not but the narration of the administration of the chloral may be interesting.

An aqueous solution was prepared, of the strength of twelve grains t twenty minims. A solution of strychnine (two grains to the ounce) was als prepared. At 10.30 a.m. ten minims of the chloral solution were injecte subcutaneously into the right lower leg. At 10.38, there was no perceptibl effect; the child cried continuously. At 10.40, ten minims more were inject ed subcutaneously into the lower part of the left leg, and the child was give to its mother to carry about. At 10.45, the patient was drowsy, but easil roused; she started and cried whenever the mother would lay her down At 10.55, ten minims more were injected; at 11, she was sleeping apparentl soundly. There was no flushed face, but the pulse was rather quick. Sh awoke and cried. At 11.5 ten minims were administered by the mouth She dropped off to sleep in a few seconds, and began to snore. Pinchin made her cry, but she fell asleep immediately. At 11.18, ten minims mor were administered by the mouth. At 11.20, she was in a deep sleep.

The operation was now performed. During its performance she began to cry but made no struggling to speak of; the eyes remained nearly shut, and th crying seemed that of a dreaming child. Immediately she fell asleep again a sound as ever. Strong tea was prepared, of which she was made to drink cupful. Her pulse was quick but firm, so we let her alone. She slept deep ly for over two hours. More strong tea and milk were then given her, and in another three-quarters of an hour, she sat up dazed, looking quite unterri fied, and apparently oblivious to any pain. Next morning she took her por ridge and milk with quite a good appetite.

Altogether, the administration of chloral seemed better than that of chlo roform—in this instance at least. There was no convulsion, nor apoplecti appearance, and no unnatural disturbance of the breathing. There was n subsequent sickness nor any apparent ill effects. We conceive that chloral ism would be much safer and better than chloroforming in ophthalmic ope rations.

We were glad we had no cause to use the strychnine, but would not hav hesitated to inject it subcutaneously if there had appeared any necessity. W have administered strychnine frequently after chloroforming, and generally found an immediate good effect in brightening up the patient and prevent ing sickness. Subcutaneaus injection would, therefore, very likely be suc cessful in restoring animation in cases of chloroform poisoning.

Next time we use chloral we intend to have a much more dilute solution and a larger syringe, and to inject it into a vein. By these means, we hop to avoid the pain caused by the injection, provide as far as possible agains phlebitis, prevent the formation of painful swellings or ecchymoses, and se cure the more immediate introduction of the fluid into the circulation. Tota unconsciousness does not seem at all necessary to produce anæsthesia, as, al though the girl woke up and cried during the operation, she made no strug gling, and was asleep before her cry was finished.—*British Medical Journal June* 26, 1875, *p.* 845.

34.—ON A NEW OPERATION FOR THE CURE OF CERTAIN CASES OF AGGRAVATED "KNOCK-KNEE."

By THOMAS ANNANDALE, F.R.S.E., Surgeon to the Edinburgh Royal Infirmary, and Lecturer on Clinical Surgery.

On the 3rd of March last, a little girl, æt. 6, was brought to me from Glasgow, on account of a serious deformity of her right leg. Mechanical means had been employed for two years with the object of relieving the condition, but without success, and the deformity was steadily increasing in severity.

A careful examination determined an aggravated form of "knock-knee," and it was found impossible, in any position of the limb, to bring the leg into a straight line with the thigh, the head of the tibia forming a considerable angle with the condyles of the femur. The femur had a distinct bend inwards and forwards about the junction of its lower and middle thirds, and the condyles of this bone were much more oblique in their direction than in their natural condition. In Fig. 1 the position of the bones is illustrated diagrammatically. The adductor muscles were somewhat contracted, and the distortion was such that the patient walked with difficulty. The left limb was well developed and natural in position. A study of the case convinced

Fig. 1.

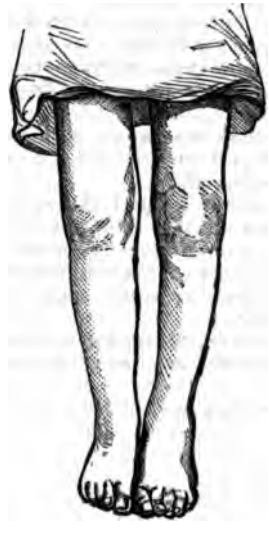


Fig. 2.

me that the oblique position of the condyles, the result apparently of the bending of the shaft of the femur, was the principal obstacle which was preventing the tibia and leg being brought into line with the thigh, and it therefore seemed to me, that if this obliquity could be removed, the deformity might be cured or very much relieved.

Two ways of removing this obliquity suggested themselves. The first was to divide the shaft of the femur at the point where bent; the second, to remove an oblique slice of the condyles. The latter operation would be attended with more risk than the former, because it necessitated the incision of the knee-joint. But some little observation decided me to adopt the latter proceeding, for I felt sure that it would be more effectual than the former, and I trusted that the risks of opening into the joint would be counteracted by the careful use of the antiseptic treatment.

The consent of the child's parents having been obtained, I operated on the 16th of March in the following way:—

An incision, about five inches in length, was made along the inner

aspect of the knee-joint, the articulation opened into, the internal lateral ligament cut across, and the patella and its ligament being drawn outwards, the crucial and external lateral ligaments were also divided. An oblique slice (illustrated by the dotted line A in Fig. 1) was then sawn off from the condyles of the femur, the tibia not being interfered with. After the removal of this slice of bone the leg was readily brought into a straight line with the thigh; and a drainage tube being inserted into the cavity of the joint, a few sutures were applied, and the limb placed on a wire splint, in the straight position. The whole operation was performed under the antiseptic spray, and the usual antiseptic dressing was applied to the wound.

Some suppuration of the wound followed the operation, but this gradually ceased, and, on the 24th of March, the discharge was so slight that the dressing was changed only once in two days. On the 25th of April, the wound was quite superficial; and on the 29th of this month, the wound was soundly healed. On the 6th of May, the patient was allowed to get out of bed, the joint being supported by lateral splints, which were removed daily to permit of passive movements of the joint being made. On the 30th of May, the splints were entirely removed, and the patient allowed to bear weight on the limb. At this date, the limb was perfectly straight, and of equal length with the opposite one. The lateral mobility of the joint was slight, and very much as in the natural condition. Flexion and extension were very limited. Fig. 2 is a careful copy of a photograph which was taken at this time.

On the 5th of June, I placed the patient under chloroform, and forcibly bent the knee to rather more than a right angle, and I also moved the joint freely, so as to break down the adhesions which had resulted from the operation. No bad consequences followed this forcible bending of the knee; and two days after, the patient was again going about the ward with the help of crutches, and able to bear weight upon the limb, the mobility of the joint being decidedly improved.

Remarks.—I am not aware that this or any similar operation has been before practised in cases of knock-knee, but the successful result obtained in the case reported, encourages me to recommend this method of operating in certain aggravated cases of the deformity which have resisted the division of the biceps tendons, or other tense structures, and carefully-applied mechanical treatment.

The employment of the antiseptic treatment in this and similar operations I consider most valuable, and I must confess that it was my confidence in this treatment which led me to freely incise so important a joint, and to carry out the proceeding described.—*Edinburgh Medical Journal, July* 1875, *p.* 18.

35.—THE CURE OF BENT KNEE AND THE IMMEDIATE TREATMENT OF CONTRACTED JOINTS.

By Dr. J. Morgan, Surgeon to Mercer's Hospital, and Professor of Anatomy to the Royal College of Surgeons, Ireland.

I here introduce the method adopted as a bone-setter's method, taken from Mr. Hood's book.

The operator, as will be perceived, grasps the heel of the patient between his knees, the inner condyles resting on its sides, just below the ankle-joints. By this means the foot serves as a lever to rotate the leg; the hands grasp the knee and the thumb is situated upon the painful point, which, in bone-setters' *parlance*, is where the "bone is out." The operator then rotates the leg by a lateral movement of his thighs, and then directly flexes it by the movement of the hands and thighs together; this movement can only carry flexion to a certain point: as soon as this limit is reached he relinquishes his original grasp, and places his right forearm near the wrist under the knee as a *fulcrum, grasps the leg* near the ankle with the left hand, and flexes to the

ent. From this description it will be seen that the method originally
ed by Hey for his internal derangement of the knee-joint (often so
an accident) is simulated; and, therefore, in such obscure cases suc-
ld follow this action and the application of the thumb to the painful
while in cases where adhesions had existed, the active flexion and
" of the joint would at hap-hazard break through those that had im-
its motion, and thus liberate a limb which had long given inconve-
and concern.

knee being now straight—in the case I have detailed—I laid it in a
pared splint, having padded the joint round with wadding; I gave
te that afternoon, and let the child gradually recover, as already de-
with perfect results.

is instance I did not use passive movements to obtain a very movable
n, from the long standing of the disease, I did not anticipate much
ate results as to motion. I put on a lateral support, leaving the motion
gulated more at the child's will, and by degrees. Every day showed
rovement. But were the adhesions more recent, I would, after a few
have used gentle passive motion, by swinging the limb, or otherwise.
lammation might be more apprehended in such recent cases, it may be
keep pounded ice or evaporating lotions round the joint, and use every
able precaution against inflammatory action being set up. The small
nt of pain that was experienced after the extension of a joint so long
gether was in the case detailed and in other similar instances remark-
ittle, so much so indeed that we might almost believe in the assertions
ersons who submitted themselves to the operation as cripples walked
ir homes.

amount of extension to be used, it will be observed, was such as suf-
to straighten the limb. I felt, as I have stated, the adhesions give way
—first, on increased flexion, and then on extension being made care-
and with more or less a series of quasi jerking motion than of a violent

If the joint is to be straightened at all, it had best be done thorough-
d have the adhesion fully disrupted; half doing so, or fiddling with it,
but to irritate and set up renewed inflammatory action. It is best to
these adhesions torn, not stretched, which would only enable them by-
y to re-establish the inconvenience it is sought to annihilate. This, in-
, seems to be in a great measure the advantage of the "bone-setter," who,
professionally irresponsible, and ignorant of the dangers of joint dis-
does not hesitate to rupture fully any obstructions to motion. Mr.
remarks on this subject :—"The chief thing necessary is to have con-
ce, and to exert sharply and instantaneously the full leverage given by
imbs. If the operator attempts to move slowly, he will probably in
cases stop short of doing good, *i.e.*, of rupturing the adhesions. A
operator may easily do mischief by traction upon joints, which after
e fails to relieve, when a bolder and more rapid movement would at once
set the patient free. I am disposed to think that much of the fear of arti-
inflammation entertained by surgeons is based, if upon clinical facts at
almost entirely upon the results of motion of an inefficient kind sufficient
ncrease the hurtful traction of an adhesion, but insufficient for its de-
ction." The remark made on these occasions when an adhesion is broken
ugh, "Did you hear that ?" fully explains the practice. The result is a
ter for observation.

nother very successful case will form a good illustration of the advan-
s of this method of treatment:—E.B., a girl now aged sixteen, when but
ild of five years, first suffered from symptoms of "white swelling" of the
e; it eventually suppurated, and after a long contest with the disease,
ing which amputation was suggested on more than one occasion, the limb
overed in a state of anchylosis. Even a preposterously increased cork sole
s inefficient. There was now eleven and a half inches of space between
toes and the ground when the girl stood up, and even with her crutch and
immense sole to the boot she could not walk.

For eleven *years this girl had suffered* from this bent knee. Her form was
seriously disfigured, and her health impaired. On examination I found that

a certain amount of flexion remained, but that extension was impossible. I put her under the influence of ether and tenotomised the inner hamstring, and immediately closed the slight wound made. I could find that one great obstacle was at once overcome; then by the aid of an assistant and my own effort, whilst grasping around the joint firmly, as I have represented already, I extended the limb, and felt very firm adhesions break down within the joint. I thus could bring the limb all but straight. I then laid it in a comfortably-prepared splint, and bandaged from the foot upwards. In eight days, not being quite satisfied with the appearance, I again etherised her, and by force straightened and broke down some adhesions which still remained, and again replaced the limb. The adjustment was not disturbed for six days, and in three weeks she was walking about, resting on the sole of the foot. She has been going about the house up and down stairs, and now (in October), can walk as well almost as ever, though she prefers wearing slight supports to the joint, consisting simply of two lateral iron rods fitting into sockets at the sole of the boot, with a leather support over the point of the knee. The joint has recovered a wonderful amount of motion, and the support is not really required, but she prefers it, as giving confidence while walking.

Here again the most satisfactory results were obtained. A member which had been useless for eleven years was made in a few weeks nearly as perfect as ever—without bloodshed, long confinement, or the use even of complicated apparatus, the crutch and preposterously soled boot being kept now as cherished curiosities only.

In June, 1873, a country girl, aged seventeen, was sent up to Mercer's Hospital for treatment, suffering from a bent knee for six years, the result of similar disease. No abscesses had formed in her case, but the joint was firmly fixed at nearly a right angle, and she could not put her foot to the ground, a crutch being essential to her. As her existence depended on her exertions, she was most anxious that something should be done to regain the use of her limb. I found the inner hamstring very resisting. On June 12, 1873, she was put under the influence of ether, the hamstring tenotomised, and extension was made as in other cases I have detailed. The adhesions were felt and heard giving way "crack, crack," and the limb was straightened at once, then laid on a splint, and in three weeks the girl was walking fearlessly along. She left hospital on July 9, 1873, and shortly afterwards wrote up, expressing her gratification, and saying that she was able to go about without inconvenience, beyond slight stiffness, and without a stick or crutch.

On October 21st, 1874, I extended the joint of a girl, aged nearly sixteen, who had not put her foot to the ground for eight years, but constantly used a crutch. She had first suffered when between six and seven years of age from white swelling of the knee-joint. Very firm adhesions had formed, as indicated by the feel, and by the fact that while extension was almost lost, flexion was also extremely limited, and the tension of the hamstrings had little or no influence on the deformity: as the girl had grown rapidly during the long period of inutility of the limb, the leg had wasted, and its nutrition suffered so far that it was smaller and shorter, from the head of the tibia to the sole, than the opposite leg, by nearly two inches, while the angle formed was, as shown by the tracing, very considerable. The patella was evidently bound to the condyles of the femur, while, however, a certain amount of "spring" existed between the femur and tibia. The latter had also yielded backwards from the femur. I believed that if bony anchylosis had formed it was between the patella and femur alone. I could not expect in this case, as the leg was smaller and shorter than its fellow, so good a result as in the preceding cases.

On October 21st, 1874, I put the patient under ether, and getting one assistant to extend the leg, and another the thigh, I myself grasped round the knee-joint. I found, as extension proceeded, that the semitendinosus became an opponent. I divided it with the tenotome, and closed over the wound with plaster, and I then made powerful traction from behind forwards against the head of the tibia, which from its having already gone backwards *from* the femoral condyles, I carefully guarded from further dislocation. I *rested the patella against* my chest; after a moment or two the adhesions

were felt giving way freely, and the limb was straightened as far as the altered position of the tibia allowed. A gutta-percha splint was laid on the back, and bandaging put on from below upwards. Cold lotions were applied to the joint in the succeeding twenty-four hours, fearing any inflammatory action after the disruption of such long-existing extensive adhesions. No inconvenience followed.

In this instance I do not anticipate that mobility to any great extent can return to the joint, and the straight position only can be maintained, and will leave about one and a half inches of shortening, which can be replaced by a thickened sole. I saw this girl stand with her foot laid flat down in six days after my operation of extension.

But in younger patients, as Mr. Barwell remarks, "the epiphysis of the tibia, which has not united, may be broken through and the leg brought into the same line as the thigh, the upper end of the diaphyses will then rest against the edge of the epiphyseal end, and the limb will be only shortened by little more than an inch." (In Fig. 5 will be seen the mode of drawing on the dislocated epiphysis should occasion arise.) In all cases the ultimate object to be gained should be predetermined by the operator. Should it be found that fibrous bands alone, which yield with tolerable ease, constitute the obstruction, then, after their disruption, motion, to a greater or less extent, should be sought to be obtained, and often in the smaller joints will be restored to an incredible amount. On the other hand, if the union be found to be dense and resisting, and to have resulted from a long-continued form of disease, the patient and surgeon may be fairly satisfied with a more limited area of motion, or even with a stiff joint brought, however, into so favourable a position that it will convert a useless and inconvenient appendage into a limb capable of supporting the weight of the body and of being used satisfactorily in progression. In cases where extensive disruption has been established, it may be judicious to put the limb in a gutta-percha or other splint which had been *previously* moulded to the distorted joint, and to apply cold lotions or pounded ice should any inflammatory action ensue, and after a few days to lay the limb in the more extended posture, using passive motion from day to day. I think patients will, however, regulate the amount of motion for themselves, if a lateral support, with a band across the joint, be supplied them for a short time. No definite rule can, however, apply to each case; discretion and experience must guide the way.—*Medical Press and Circular*, *Dec.* 2, 1874, *p.* 478.

36.—ON REDUCTION OF DISLOCATIONS.

By James Spence, Esq., F.R.S.E., Surgeon in Ordinary to the Queen in Scotland, Professor of Surgery in the University of Edinburgh.

The manual method of reducing dislocations of the hip has been revived and used with great success; so much so, that the reduction of these luxations, which formerly entailed much trouble and the expenditure of great force, can now be effected in recent cases as if by magic. I have said that the use of the rotatory or circumduction method has been revised: perhaps I should rather have said revived as a general practice, for, in truth, it has never really been altogether abandoned. We generally hear it spoken of as the American method, and undoubtedly it is to the writings of Drs. Reid and Bigelow of the United States that we owe the more general use of the practice in this country; but it is not a little curious that it has been so little known or used, seeing that it is mentioned and described in some of the principal French works on surgery—not old black-letter, but modern books, in the possession of most of us. Thus in Nélaton's "Pathologie Chirurgicale," published in 1847-48, there is the following statement in reference to dislocations of the hip. "In 1835, M. Desprès made known a method which cannot be too highly recommended on account of its simplicity and the real services which *it has rendered in certain difficult* cases. . . . This method consists in

flexing the leg on the thigh, the thigh on the pelvis, to exaggerate even the movement of flexion and adduction of the limb, then to exercise with it a gentle movement of rotation outwards, whilst at the same time it is abducted." This method, says Nelaton, is described by Pouteau in his "Mélanges de Chirurgie." M. Chassaignac, in the second volume of his "Opérations Chirurgicales," 1862, speaks of this method of reducing dislocations of the hip, and quotes the text of Pouteau as follows. "Surgeon-Major Maisonneuve, of the regiment of Maugiron, a man of great merit, and trustworthy, assures me that he has reduced such luxations without the assistance of any extension. He first flexes the thigh at a right angle with the body; he then executes with the thigh a movement of rotation, which makes it approach the belly as nearly as possible, then carries it out towards the haunch, and returns it immediately by drawing it down towards the sound thigh." Pouteau adds that this method was known to the ancients, and that it is mentioned by Hippocrates and Paulus Ægineta. The diagram I point to is an enlarged copy of an illustration from a French work on "Bandaging and Surgical Appliances," by Dr. Goffrés, published at Paris in 1859, and shows the surgeon in the act of using the manual method of Desprès. For this I am indebted to my friend Dr. Paterson, formerly of Bahia. M. Chassaignac enters very fully on the principle of the method; and there is a curious sort of concidence in terms between his use of the letter Y, to assist his description, and the use made of the same letter by Dr. Bigelow, to mean a totally different thing. Dr. Bigelow speaks of the Y-ligament as playing an important part in the rotatory method, describing the ilio-femoral ligament under that name, on account of the divergence of its fibres at their attachment to the femur. Chassaignac describes the leg and thigh, when bent, as representing a pair of compasses opened at a right angle, the lower or horizontal branch represented by the leg, the upper or perpendicular branch by the thigh—this latter divided at its upper extremity into two parts, like the letter Y, one part being fixed, represented by the ilio-femoral ligament, the other movable, represented by the head and neck of the femur,—and then proceeds to demonstrate how, by using the leg as the arm of a bent lever, whilst the ligament, being fixed, forms a pivot—the movable part—the head of the femur is forced or directed to the acetabulum. Here we have an example of advance by the attention of the profession being directed to a method which has been practised from an early period, and which has never been altogether obsolete.—*Medical Times and Gazette, Aug.* 21. 1875, *p.* 208.

37.—ON SUBPERIOSTEAL SURGERY.

By James Spence, Esq., F.R.S.E., Surgeon in Ordinary to the Queen in Scotland.

In excisions of joints, I think the subperiosteal method must be used with discrimination. In cases where, as in the lower extremity, a firm solid support, and not a movable joint, is desired, its value is at once evident; and perhaps in some excisions of the upper extremity, in which we require to remove a very large amount of bone. In ordinary excisions of the upper extremity, we are more troubled with redundancy than deficiency, and generally require to remove a considerable amount of bone to prevent anchylosis from occurring; but in truth, in a great many cases, the question is settled for us by the disorganised state of parts on which we operate.

There is one class of cases in which subperiosteal surgery seems likely to achieve some brilliant successes: I mean cases of acute necrosis, as they are called; in other words, cases in which inflammation of the dense shaft of a long bone has been so rapid, general, and violent, that nutritive changes seem arrested; and the bone separated, or nearly separated, from the investing periosteum, is exposed, with its surface bare, smooth, and white, as if dead. Although in such cases the constitutional disturbance, at first from irritative fever, and subsequently from hectic, always places the patient's life

in great jeopardy, and though the tendency of the local action to spread to the epiphyses and involve neighbouring joints is very great, we have hitherto been content to wait patiently, often most anxiously, for nature to separate between the dead and living bone, before interfering. In cases where the state of the patient seemed to point to amputation as the only chance for life, the results have been so unsuccessful, that I think it scarcely warrantable. Now, however, by separating any remaining connection of the periosteum, and resecting and removing the diseased portion of the shaft, the long process of separation is avoided; the constitution is saved the tax on its powers from discharge, irritation, and hectic; the periosteum which is left furnishes new bone to take the place of that removed by the surgeon; and the limb gradually assumes its normal form and usefulness. Here it would seem, we have clear advance in the treatment of disease; and I believe it is a real and great progress. Still, we must look at it carefully, from different points of view, so as to make sure of this, and avoid the method suffering from being practised indiscriminately, or in improper cases, or during unfavourable conditions. We must remember that, in what we call acute necrosis, the loss of vitality seldom extends to the whole thickness of any great length of the bone; that, whilst the periosteal sources of nutrition may be largely or entirely cut off, the vascular supply and nutrition of the medullary canal and the ossific centres may not be, and rarely are so, to the same extent; and hence we can never be sure for some time how much of the affected bone may really perish, whether there may be a large portion to separate ultimately, or merely superficial exfoliations; or, as I have shown, the whole surface of a long bone like the tibia may be exposed bare and white, and yet granulate and heal without a vestige of exfoliation occurring.

But, whilst I think it right that these things should be kept in mind, lest we interfere ultroneously and remove texture which natural processes would have saved; on the other hand, looking at the matter practically, when we see a patient suffering from hectic or occasional hemorrhage from ulceration of vessels near the diseased bone, and when we consider how long he must be exposed to such sources of debility before the dead bone separates, and the risk of the implication of neighbouring joints occurring and necessitating amputation, I am shut up to the conclusion that resection and removal of the affected bone must be often indicated; and that, if the cases for its performance be judiciously selected, and the operation be properly effected, this method will be found to be a most valuable addition to our resources.

The important question, no doubt, arises, How far can we trust to the reproduction of new or substitute-bone from the periosteum, when the whole thickness and nearly the whole length of a long bone like the tibia has been removed by operation? And this question not unnaturally suggests itself, because we know from experience that under the expectant plan, when large and long sequestra were removed, the thickness of the shaft was never renewed to its full extent, although under that method we have both bone and periosteum to furnish new material. Here, for example, is a specimen, showing a large sequestrum removed when loosened by Nature, and a cast of the leg showing the appearance of the limb after the cure was completed.

During last winter, Dr. McDougall, of Galashiels, now of Carlisle, exhibited a child to the Medico-Chirurgical Society of Edinburgh, in whom he had resected the tibia in a case of acute necrosis, and the thorough reproduction was well seen, and the use of the limb was perfect. In April last I operated on a similar case, and resected the shaft of the tibia close to the epiphysis at each end, after separating the periosteum. Here is the portion removed; and as the case is still in hospital, the members of the Association can judge of the probable result, so that I think we may trust to the periosteum for entire reproduction of the part removed. To these and similar successful cases it may be objected that in cases of compound fractures, when the broken bone protruded, divested of periosteum, resection of the denuded bone was and is frequently practised; but experience has shown in such cases that when the portion of bone so removed is large, reunion is almost never perfect; the ends of bone are atrophied and joined together by a tough fibrous material; *or, in the case where there* are two bones, as in the leg and forearm, the en-

of the resected bone approximate and unite with the other bone. A little consideration, however, will show that there is really no parity between such cases and resection for acute necrosis, because in the case of compound fracture the periosteum is not merely separated, but is generally so torn and bruised that its vitality is destroyed, or so impaired that its reproductive powers are rendered very imperfect; whereas in necrosis its vascularity is increased; the membrane thick and flesh-like, and it almost invariably carries with it small nuclear portions of bone-tissue.—*Medical Times and Gazette, Aug.* 21, 1875, *p.* 207.

38.—THE TREATMENT OF FISTULOUS SINUSES BY MEANS OF THE ELASTIC LIGATURE.

By W. Allingham, Esq., Surgeon to St. Mark's Hospital, &c., Dublin.

In February of 1873, Prof. Dittel, of Vienna, made a communication to the Imperial Medical Society of that city on the advantages of the india-rubber ligature over other means in the treatment by operation of several surgical affections. At that time Prof. Dittel thought he was the originator of the method he described and advocated, but subsequently he discovered, or was informed, that Dr. Grandesso Silvestri, of Vicenza, had proposed a similar procedure, and even carried out some operations in the year 1862, or more than ten years prior to Prof. Dittel.

It also appears that a much honoured Fellow of this Society, Mr. Henry Lee, had read a paper in the year 1870, at the Medico-Chirurgical Society, on the use of an elastic ligature in the removal of nævi, and further, that at the same meeting, Mr. Holthouse claimed priority for himself, having, he said, employed the elastic ligature in cases of fistula in ano, and for the division of bridges of skin between fistulous orifices. Admitting, therefore, as Prof. Dittel immediately and most readily did, when the facts were brought to his cognisance, that he was not the originator, still, whatever credit may be due to the method must really be ascribed to Prof. Dittel, as the man who, by a series of experimental operations, showed what really could be accomplished by the ligature; in fact, he has done what had evidently never even been dreamed of by those gentlemen who employed it before him.

After reading myself Prof. Dittel's paper, I came to the conclusion that, assuming his statement of facts to be worthy of credence—and there was every reason to believe them to be so—we might find in the india-rubber ligature a valuable addition to our usual modes of operating, and very importantly so in that branch of surgery to which I had paid especial attention. I was perfectly willing to make every allowance for the enthusiasm of the originator of any novel proceeding, and did not expect wonderful results from the ligature; most certainly I did not imagine for a moment that it would ever supersede the knife in the vast majority of cases, although I thought it might replace it with advantage under some special conditions. I was also perfectly aware that the objection that the method was unscientific might be advanced against it, and also that it essentially lacked the brilliancy pertaining to operations by the knife; but looking rather on the practice of surgery as an art than as a science, and considering that the first and great object of a surgeon's life should be to cure, and further that he should try to cure as quickly, pleasantly, and as safely as possible, I determined to fairly test the elastic ligature in what I thought suitable cases, feeling my way to more important attempts should I find encouragement to do so. Most of you, I dare say, well know how accidentally Prof. Dittel discovered in what a facile way a thin india-rubber cord could cut into dense tissues, even solid bone, and that in the elastic nature of the ligature resides its peculiar power.

Ligatures of thread for a great many years, even, we may say, from the time of Ambrose Paré, have been employed for cutting through certain structures, mainly arteries; but hemorrhoids, nævi, warty and pedunculated growths *have constantly been* removed by the application of a ligature, and the rea-

son it has not been more extensively available has arisen from the fact that only a comparatively limited thickness of tissue can be cut through by *one* application of the ligature, which, as suppuration takes place, becomes loose, and then does not penetrate further unless it be retightened; it is only therefore small and soft growths that can be safely and advantageously treated by the thread ligature.

Various means have been devised to overcome this inherent defect, and make the thread ligature cut, by constantly or frequently tightening the thread—such means are shown in Ricord's instrument for the treatment of varicocele; Mr. Luke's double screw, which he invented for cutting through rectal fistulæ which ran so high up the bowel as to be considered dangerous of division with the knife. A variety of methods, of which the spiral spring is the essential, have also been employed, from the using of a wooden spiral-spring letter-clip up to the very ingenious sarcotome of Dr. Ainslie Hollis.

To all these methods, comparatively good as they may be, some very strong objections may be raised. From considerable experience, I know that Mr. Luke's double screw, valuable as it has proved, causes very intense pain; the daily or frequent necessity for tightening the ligature inflicts upon the patient a torture often unendurable, and on many occasions the knife has had to complete what the ligature began, the patient being unable to endure the long-continued suffering. Another very grave objection to the intermitting application of pressure is the frequency with which secondary abcesses result. I have had this not uncommonly occur in my own practice, and seen it also in that of other surgeons.

Dr. Hollis's ingenious sarcotome is very superior to the others in its action, but even this requires tightening or re-setting from time to time; it acts also only in one direction, and therein lacks the even *circular* pressure exerted by the india-rubber. Another important objection is its size and weight, which render it, under many conditions, inapplicable; and lastly, its expense is very considerable, and you would require quite a stock of them if you wanted to use the instrument frequently.

It must be evident, on reflection, that the pressure of the india-rubber band or loop is not always the same during all the progress of the cutting: in fact, it diminishes gradually as the loop of the ligature becomes less in circumference: but practically, the pressure up to the moment of separation, if properly adjusted at first, is sufficient for its work.

The utmost pressure exerted by a solid india-rubber ligature of the thickness of $\frac{1}{16}$th of an inch, stretched to the utmost, only equals $2\frac{1}{4}$ lbs. weight; for example, 6 inches of india-rubber, when stretched to its utmost, *i.e.*, 3 feet, exercises a power of $2\frac{1}{4}$ lbs.; when stretched to two feet, only a little more than $1\frac{1}{4}$ lbs.; and when stretched only one foot, or double its length, $\frac{1}{2}$lb.; and even this power is quite sufficient, as shown by experiment, to pass through any ordinary tissue, in consequence of its unremitting and even pressure in every direction. In my experience, now, I do not think it necessary, or even desirable, in ordinary tissues, to fix the ligature so tightly around the part to be severed as I formerly did. I believe a slighter equable pressure will effect safely and more painlessly all we require. In fact, the elastic ligature does not so much cut as gradually compress and render dense the part contained within the loop, and this is how its action differs from inelastic ligatures—uleration taking place on both sides of the loop, so that when the ligature comes away, actually a portion of the tissue is found contained in it; so hard, dense, and semi-transparent is this as to resemble horn.

In my earlier operations I used a small drainage-tube, tied in a reef knot, as recommended by Prof. Dittel; this does not answer so well as the solid india-rubber used by Sir Henry Thompson, and I never now tie a knot, as the knotting very easily breaks the india-rubber; but I adopt a plan I will presently describe. In my early cases, when employing the drainage-tubing, I twice had to tighten the ligature, as I thought it was not exercising sufficient pressure; but I now know this need scarcely ever be done if the ligature be properly adjusted at first.

I am myself thoroughly convinced that there are decided advantages in the *india-rubber ligature* over the knife in many surgical cases: it

is my intention to-night to confine my remarks specially to the subject of its use in sinuses; but I may mention that I have an experience of the ligature in sixty operations, the characters of which I will only mention—viz., twenty-eight cases of fistula in ano at St. Mark's Hospital, and twelve in private practice; five cases of hemorrhoids; two cases of sinuses in the groin, one in the neck; two removals of scirrhous breasts; two cases of pedunculated tumours (one case of my own, the other Mr. Shillitoe's, who applied the ligature at my recommendation, and with my assistance, and with excellent result); two cases of varicocele; two of varicose veins; one division of the sphincter ani muscles, in case of great tendency to hemorrhage; two cases of linear rectotomy; one nævus. In none of my cases has there been any serious "contre-temps." I have only once seen a secondary abscess following the ligature. I have never had a case of erysipelas, and the resulting wounds have been uniformly remarkably healthy. Many of my cases at St. Mark's Hospital were treated when the hospital was by no means in a good hygienic condition; but all my ligature wounds went on well, and generally were much healthier than the wounds in patients in adjoining beds that had been made with the knife. I frequently showed to gentlemen who accompanied me around the wards my cases of ligature doing perfectly well, and my incision cases very much the reverse, although precisely the same after-treatment had been adopted in each—viz., the application of carbolised oil. Our resident surgeon, who of course had the opportunity of watching the cases day by day throughout the treatment, often commented on how much better the ligature cases did than the others. Here I must mention that I did unfavourable as well as favourable cases with the ligature (three of my twenty-eight hospital patients were decidedly phthisical), and when occasion presented, I chose two patients whose cases were as much alike as possible, the patients being also nearly of an age, both healthy-looking, and as far as one could judge, both likely to do equally well. The result of this experiment was uniformly in favour of the ligature.

In nineteen ligature cases the average time in the hospital was twenty and a quarter days, while in nineteen selected incision cases (selected to exclude very bad ones), the average time was thirty-five days.

Broadly one may state these probable advantages of the ligature over the knife in dealing with sinuses of an ordinary character:—

1. The operation is commonly painless, and the subsequent suffering, if any, is usually very slight.
2. It is bloodless.
3. There is great rapidity of cure.
4. The patient need not keep his bed, nor even his room, but may go into the air, driving or walking in moderation.
5. Its peculiar applicability to delicate patients, and those who have a phthisical tendency.
6. There is usually no anæsthetic required.
7. There is a minimum amount of suppuration.
8. And one may add that the ligature is often very advantageous as a supplement to the knife.

I shall make a few observations on each of these points, and relate some illustrative cases.

The operation, if it may be called so, is really painless, *i.e.*, no more pain is inflicted than that which is caused by the passage of a probe through a sinus, and this, performed skilfully and gently, ought to give no pain, unless the sinus be inflamed. Should the fistula be an incomplete one, a slight amount of pain may be experienced in rendering it complete. The tightening of the ligature patients never flinch at or complain of.

The pain after the operation is usually very slight. Many of my patients said there was really no suffering, and they slept soundly the first night. Others were disturbed at times during the night after the operation, but afterwards were free of pain; others, delicate, excitable people, complained for some two or three days: but persons behave so differingly under pain that it is very difficult to speak positively on this point. The best proof that

the pain is but slight may be deduced from the fact that several of my patients have gone about their business, and not laid up more than a day; for example, a gentleman in a bank had three sinuses in his left groin, the result of suppurating buboes of long standing; one sinus passed round the thigh towards the perineum; the length of it was 8½ inches. I put an elastic ligature through it one Saturday afternoon; he had pain in the night, and more or less on Sunday; but on Monday he went to his business, and continued daily to do so. The ligature cut its way out in six days, and the wound looked splendidly healthy. Emboldened by this success, on the following Saturday I put two more ligatures through the other sinuses, and again on Monday he went to his office—in fact, he only kept his house on the two Saturdays and Sundays, and in thirty-seven days he was perfectly well. A case of fistula in ano was treated by me in the same way under more unfavourable circumstances. A warehouseman, æt. 27, a delicate-looking man, had the ligature introduced on one Saturday. He went to work on Monday, and was occupied almost all day in standing and walking about, but without any further rest, except the Sundays; he was thoroughly cured in eighteen days.

My opinion is, founded on a fair number of cases, that absolute rest in bed, or confinement to the room or house, is by no means a necessity. Of course, I do not advocate much walking about or hard work, and, on theoretical as well as practical grounds, I should advise any patient who can spare the time, or whose case is severe, to take all the rest and quiet he could, in the hope of hastening the cure, and preventing any accidental interference with the healing process, and also mitigating possible pain.

The operation is almost, and on some occasions quite, a bloodless one. This, of course, is of no moment whatever in simple cases, where the amount of blood lost in the use of the knife is next to none; but when fistulous sinuses run very far up the bowel, and the parts are at the same time, as they frequently are, both vascular and indurated, it is an advantage not to be lightly valued. I have with the elastic ligature laid open the rectum for six inches upwards in a case of stricture and ulceration, where, from the induration and vascularity of the parts, very profuse bleeding would have inevitably followed the knife, and not a teaspoonful of blood was lost. Again, in cases of hemorrhagic tendency this method is highly useful, and it helped me out of a case which I think is quite worth shortly narrating to you.

An American gentleman was sent to me early this year by Dr. David Young, of Florence. He had long suffered from an ulcer of the rectum within the sphincter, and he had been under the care of many surgeons, American and Continental, without obtaining any permanent benefit. The usual symptoms were present in this patient, but an important feature was that for years he had frequently lost large quantities of blood from the bowel, which the ulcer did not seem quite to account for, although vascular. I made sure that the bleeding came from the rectum, and not from high up the bowel, and also that he had no hemorrhoids; but upon this point I need not dilate. When he consulted me I found, in addition to the ulcer, a small fibrous polypoid growth close to the upper edge of the ulcer, and, as I thought this might be a source of irritation and keep up the sore, I removed it, placing a ligature upon it; but the small pedicle cut through on drawing the ligature tight. On this accident occurring I carefully examined the part with a speculum, fearing hemorrhage; but, as none took place, I contented myself with placing a little styptic wool in the bowel. No doubt, as soon as the slight shock caused by his trepidation passed away, and his circulation rallied, the bleeding commenced *slowly*, for the vessel must have been very minute. The history of the hemorrhage was as follows: He dined and went to bed early, and fell asleep. After two hours he awoke, feeling very faint and sick. He took some brandy and water, felt better and again dozed off. After a time he awoke again, was faint, and felt desirous of going to the stool. This he did, and, to his great alarm, nearly filled the chamber utensil with bright red blood. He then fainted off, and was got back into bed. In my absence a neighbouring practitioner (Dr. Spurgin) was sent for, and he arrested the bleeding *by means of ice.* It recurred, however, the next day, and I finally

stopped it with the persulphate of iron. The blood was easily retained in great quantity in this case, because the patient had a very hypertrophied and tightly contracted sphincter ani, and also a much dilated rectum, the result of the habitual use of copious enemata.

On questioning my patient, he informed me that he always bled very much on the least cut or prick, and had great difficulty in restraining the hemorrhage. In appearance this gentleman was remarkably fair, freckled, and thin-skinned. After the removal of the polypus the ulcer still defied all treatment, and I became certain that it was absolutely necessary to do what I had at first advised—but the advice had not been accepted—viz., to divide the sphincter; but then came the question of bleeding, and I confess I was somewhat doubtful as to the result, when, in a moment, the elastic ligature presented itself to my mind as a solution of the difficutly.

Aided by my colleague, Mr. Alfred Cooper, Mr. Clover giving nitrous oxide and ether, I passed a double elastic india-rubber ligature under both sphincters, and tightly secured one ligature and left the other loose. I passed a double ligature, and left one loose, in order that the small wound made by my instrument might be thoroughly plugged up by the india-rubber. The operation was perfectly successful; really not a drop of blood was lost: the ligature cut through in nine days, and in thirty days he was cured, and returned to America perfectly well. He did not keep his bed, except the day of the operation, and did not at all complain of the pain, nor did he require any opiate.—*Medical Press and Circular*, *December* 2, 1874, *p.* 480.

39.—ON BLOODLESS SURGERY.

By Professor James Spence, Surgeon in Ordinary to the Queen in Scotland.

It is in connexion with operations for necrosis and the excisions of bones and joints that what is termed "Esmarch's bloodless method" of operating is seen to the greatest advantage, and these subjects suggest to me the consideration of that and other methods of "bloodless surgery." The bloodless methods may be divided into two kinds. First, those that have for their object the prevention of loss of blood during the progress of operation; and, second, those by which the surgeon is enabled to divide textures by means of apparatus which, by the very mode of division, prevent the escape of blood at the time, and also act as permanent hæmostatics.

The method of Esmarch, though another example of great improvement in carrying out a principle, can only be looked upon as a revival, not as new. The principle was clearly enunciated by the late Sir Charles Bell; and the mode of carrying it out by bandaging the limb from below, and then rapidly screwing tight the tourniquet, is described when discussing the value of the tourniquet in amputations, in his "Great Operations of Surgery." But it is not in amputation that the method is most useful or seen to most advantage; and hence it had generally fallen into disuse. The method of Esmarch, by using the indiarubber roller to expel the blood from the part of the limb to be operated on, and the strong indiarubber tubing to constrict the limb and act as compressor, effects the object in view perfectly, and hence enables us to see the parts on which we operate as in a dissection, and prevents all loss of blood during the operation. It is a most valuable assistance to us in such operations as those for necrosis and resections of bones and excisions of joints. In many cases of removal of large sequestra, or resections of the shaft of a bone especially, we can, by stuffing the wound with oiled lint, and applying a compress and bandaging the limb before removing the circular compressor, render the operation absolutely bloodless. In excision of joints where we require to tie arteries after the operation, I prefer the tourniquet to the indiarubber as a circular compressor. It is equally effective in *restraining bleeding*; and, by loosening or tightening the screw, the vessels

can be secured with less loss of blood than when the indiarubber is employed. Indeed, in many amputations, whilst the incisions are completed bloodlessly by Esmarch's method, the sudden and general oozing from the cut surfaces which follows relaxation of the indiarubber entails more loss of blood eventually than when the tourniquet alone is used. I have repeatedly amputated at the thigh and at the hip-joint, using only the tourniquet or manual compression, with the loss of not more than three or four ounces of blood; and in one case of primary amputation of the hip in the country by candle-light, in which I had the blood carefully collected from the tiled floor, as there seemed to be a large clot, I found, to my astonishment, that it barely amounted to half a teacupful. In many cases of amputation, owing to the septic state of the tissues or the malignant nature of the disease for which we are operating, I consider it inadvisable to repress the blood and other fluids—such as unhealthy pus or cancer juices—into the parts above. In such cases, I draw a band of indiarubber tubing, pressing on the limb from above downwards, and tighten it immediately above the part to be removed. This of course saves no blood to the patient; but it renders the operation bloodless in another sense, and is especially useful in private practice, as avoiding soiling the floor or furniture. In cases of excisions of joints, where the parts are loaded with pus, I constrict above and below the point to be operated on, and thus secure a nearly bloodless operation without risk of repressing the unhealthy fluids into the textures higher up. I cannot see the advantage of the Esmarch method in such operations as ligature of the femoral artery. I have had frequent occasion to perform operations of that kind, and also of seeing them performed by others; but it is rare to see any bleeding; and I think it better that the artery and vein should be left in their natural condition, that the operator may see and deal with them. An empty and collapsed vein would, I think, run greater risk of being injured than when seen full in its natural relation to the artery. I make these exceptions because I think that this form of bloodless surgery is liable to suffer from its indiscriminate use, and from over-laudation; but I have already said that I consider it a most valuable aid in proper cases, and it seems as if it were revived now with special relation to the progress of conservative energy.

The bloodless surgery comprised under the second head consists, as I indicated, in division of parts by means of the various apparatus which prevent bleeding during the process, and permanently. It includes cauterising agents, whether red-hot knives or galvano-cauteries, and crushing divisors, such as the different kinds of écraseurs. In regard to the cautery to stop hemorrhage, I need hardly say we cannot claim that as new, or as a discovery of the present time. Indeed, I referred to this as one cause that might lead an observer to suppose that we were revolving back to primitive surgery. Before the general use of the ligature, no small ingenuity was used to invent instruments which would sear and arrest bleeding as they cut the textures; and some surgeons, when they ventured to cut through living textures, used the summary method of applying hot pitch or tar over the face of the stump, to arrest the bleeding. I am old enough to recollect seeing the result of an amputation of the thigh which had been thus treated. The man had been injured on board a whaling vessel; and for lack of other aid the ship's carpenter amputated. Whether from his acquaintance with ancient surgical authorities, or simply acting on the rules of his craft, he "paid" the stump with hot pitch. The man recovered well, possibly owing to the antiseptic action of the pitch, and subsequently eked out his means of living by exhibiting himself at the surgical classes as an "Ancient Mariner" and a connecting a link with antique surgery. Although heated knives are again being used, I cannot and I do not think the profession will hail their revival as a mark of progress in surgery. But, in regard to the use of the galvano-cautery for the purpose of dividing very vascular textures, or for removing tumours in situations where we cannot reach and tie divided vessels, or where there is danger from the blood entering the air-passages during an operation, as in some *operations on* the mouth, I think there can be but one *opinion of the value of such* means, and also that modern surgery has made

advances, and I trust is destined to make further advances in this direction. The chief difficulties to be overcome are in the cumbrous nature of the apparatus and the difficulty of getting a galvanic power in moderate compass to heat a platinum wire of sufficient thickness. In the surgical manipulations, habit of using the wire requires to be attained to keep it in constant and close contact with the tissue to be divided, because at any point where the wire does not touch and give off its heat to the tissue, it fuses and gives way under the action of the electric current. Those of us who have been accustomed to use the knife will find it advantageous to acquire the mode of manipulation necessary for proper use of the wire. From the very few opportunities I have had of seeing or using the galvano-cautery, I am hardly warranted in expressing an opinion; but I think we require to modify the heat so as to divide the parts more slowly, because a large vessel cut across rapidly by a wire at a white heat will bleed at once as if cut by a knife. The écraseur is another means by which bloodless severance of textures can be effected, and it has even been employed for the amputation of limbs. Its real value, like that of the galvano-cautery, lies in its application to operations where the parts to be divided are so situated that we cannot tie the vessels or command bleeding during section of the parts. Its utility in such cases, more especially in operations on the uterus and tongue, has been longer and more largely tested than galvanic cauterisation, and as compared with our present means of applying the last-named method, it is more simple and more easily managed; but it seems to me that, from the nature of the wound left after use of the écraseur, it is more liable to unhealthy action than that resulting from the cautery; and, if that method could be rendered more manageable, I believe it would gradually supersede the écraseur.

Meanwhile, however, the écraseur is an instrument of great value for the class of cases I have alluded to, and forms another addition to the resources of our art.—*Medical Times and Gazette, Aug.* 24, 1875, *p.* 208.

40.—ON THE VALUE OF FLUCTUATION AS A SIGN.

By T. H. Bartlett, Esq.

Fluctuation in surgical affections is a symptom so common, and is in so many cases looked upon as pathognomonic of the presence of fluid, that I have thought it might be interesting to consider its true value.

I suppose it has occurred to most surgeons to have passed a knife into a swelling, feeling assured that fluid would exude, but have felt surprise, perhaps chagrin, at the crucial test they had applied, forcing upon them the conviction of an erroneous diagnosis.

I need hardly describe what fluctuation is; we all know that the sensation is due to the incompressibility of fluid, and its consequent equal movement in all directions upon the application of pressure. The degree of movement felt depends upon many conditions, such as the limpidity of the fluid, and its quantity, the depth at which it lies, and the compactness of its covering, the thickness, and the compressibility of the sac enclosing it, and also the tension of the fluid in its sac. I need hardly illustrate this, since it is evident that a fluid becoming nearly solid or semi-solid, would evidently not even intimate this sensation as clearly as a limpid fluid, and inasmuch as the depth may vary from that of the thickness of the skin to that of many inches in the human body, and the compactness of the tissues covering it from cutaneous to osseous, it is evident that this symptom fluctuation must present various degrees of distinctness, and that often only the "tactus eruditus" will enable a surgeon to ascribe to a sensation of fluctuation its true value. *Various terms* have been given by surgeons to describe these differences of *sensation, and doughiness* and elasticity are often described as varieties of *fluctuation, and I think* rightly so described, since, in very many cases, a sen-

sation is perceivable by the touch which assures us of the presence of fluid, which sensation is widely different from the undulation or thud, which is the most marked kind of fluctuation, and which is so distinctly perceptible in thin-walled ovarian cysts or in many cases of ascites. I shall not enter into the general considerations of how best to detect fluctuation, viz., by the gentle tap, the gentler the better. I have often myself in large collections best felt it by baring the wrist, placing this, say, on the distended belly, and gently tapping by one finger of the same hand; the impulse is, I think, better felt in this way than by applying the two hands, as usually directed. I may mention also that when fluid is covered by œdematous superficial structures, the pressing out of the fluid in the areolar tissue will frequently enable the fluctuation to be more clearly felt.

I may also allude to the sense of fluctuation which may, and sometimes *can only*, be felt by one finger, as in post-pharyngeal abscess, or in retro-uterine hæmatocele or peri-uterine abscess, where the presence of fluid may be frequently diagnosed with absolute certainty by a pushing or "prodding" action with one finger, but in certain cases we undoubtedly get fluid without being able to detect fluctuation as in hydroceles, where from frequent inflammation the tunica vaginalis has become much thickened, and even in very tense hydroceles, where the coverings are still thin; in some cases also of pus firmly bound down by fascia it is extremely difficult to differentiate between solid and fluid, as in deep mammary abscess. But while, on the one hand, it is often difficult to detect fluid when present, it is, on the other hand, by no means uncommon for even experienced surgeons to come to the conclusion that fluid *is* present when it is not so. As an example, I may allude to the sense of fluctuation given by the pulpy degeneration of the synovial membrane in white swelling of the knee, and to the prognosis of cysts in breast tumours, where on section none are found to exist. But my clinical note to-day has reference to another cause of false or supposititious fluctuation. Let me relate a case.

A man was under my care for a severe injury to the left knee, and I had associated with me in the case a surgeon of the highest skill and reputation. The leg became gangrenous, and there was considerable œdema of all the tissues of the thigh. My friend insisted that there was deep-seated pus, to which opinion I demurred on strong representation, having always a respect for the opinions of others; on the following day I passed into the most prominent and fluctuating part of the swelling a fine knife, which I always carry in my case, made like a fine tenotomy knife, and which I am accustomed to say will go almost anywhere without injury. I passed this to the bone with no result. My friend still insisted that there was a bag of pus, and that I had missed the sac, so I requested him to try his hand, and he made one or two incisions, with a similar result; at last the man died, and dissection showed the absence of any collection of fluid, although the symptom "fluctuation" had been most marked.

Another case, a woman with a large prominent swelling below the ensiform cartilage, which she said was hydatid cyst, and which had been tapped by a metropolitan hospital surgeon, and fluid drawn out. This patient, too, was seen by many skilful physicians and surgeons who I believe without exception came to the conclusion that there was a bag of fluid of some kind or other.

I passed an aspirator needle, and by that I mean that the aspirator was used as an exhausted needle, the stop-cock connecting the aspirator with the needle being opened, directly the needle had penetrated the skin, thus insuring that a sac existing should not be entirely passed through, and notwithstanding this, no fluid came. On another occasion I passed a small trocar subsequently connected with the aspirator, the trochar penetrating 1¾ inches, while on the former occasion the needle penetrated 2½ inches, and still no fluid came.

Now, there must be some peculiar or ill-understood or ill-recognised condition which led many skilful and careful men into error, and which are constantly leading our students into similar mistakes.

I believe this false fluctuation to be generally due to the combination of

two causes of error, one being muscular or glandular elasticity, and the other being muscular or glandular displacement.

I think any one who tries the experiment will be surprised at the sensation of fluctuation which can be obtained by pressing alternately, as in endeavouring to find the sense of elasticity or fluctuation of an abscess, a muscle across the direction of its fibres, say the biceps, or by similarly manipulating across the direction of the ducts, a firm and fairly large female mamma; either one of these two before-mentioned causes alone might mislead: I mean either the displacement of the gland or muscle or the elasticity of the gland or muscle: but when you get combined the elasticity and the displacement, a supposititious fluctuation is felt so like to the real as to be almost if not quite undistinguishable from it. How, then, are we to be certain, especially in these positions, where either a gland or muscle are liable to mislead us, that the fluctuation we feel is really due to fluid? By a very simple plan, which I have never known to fail, and which is not clearly enunciated to my knowledge in any of our text-books, viz., by practising the manœuvre of palpation, not only across the line of the muscular fibres or of the gland ducts, but also in a direction at right angles to this.

If the fluctuation be fluid it will be equally felt in all directions; if it be due to muscular or glandular elasticity or displacement, or both combined, it will be only felt in one direction, viz., across the muscular fibres or the gland ducts.

Let me mention one more case. I have at present under treatment in the General Hospital a young man with hip disease. There was present a barely recognisable pulsation behind the trochanter, and it was a question whether or no there was fluid. I diagnosed that there was. Now, in this position you have the fibres of the gluteus running obliquely downwards, which will give the sensation of fluctuation, while beneath these you have the gemelli pyriformis tendon and quadratus femoris running from side to side, so that it is necessary to palpate in a least three if not four directions to be quite sure that the fluctuation that is felt is not suppositious. By practising this manœuvre I was able to satisfy myself and to give a positive diagnosis of the presence of fluid, a diagnosis that was confirmed by the use of the aspirator. I would just sum up my conclusions,—that fluctuation of the most distinct kind may be caused either by the elasticity of muscular fibres, or by the displacement of muscle: by the elasticity or displacement of glandular tissue; that this only occurs in one direction, viz., across the fibres of the muscle or the general direction of the gland ducts; that palpation at right angles to this will differentiate the false and the true fluctuation, inasmuch as false fluctuation is felt only in one direction, while true fluctuation is felt equally in all directions; that where different layers of muscles take different directions, care must be taken to palpate at right angles to each layer of muscles.—*British and Foreign Medico-Chirurgical Review, July* 1875, *p.* 202.

ORGANS OF CIRCULATION.

41.—ON THE SURGICAL TREATMENT OF POPLITEAL ANEURISM.

By Timothy Holmes, Esq., M.A., Professor of Pathology and Surgery to the Royal College of Surgery.

[In this paper the results of the treatment of popliteal aneurism in the hospitals of Great Britain is considered.]

With regard to the relative success of cases in which ligature is employed *after the failure of* compression, we have in our hospital table 44 cases in which

the femoral artery was tied under these circumstances. Death followed in eight cases : in one from pneumonia and disease of the valves of the heart ; in one from disease of the kidneys; in one from aneurism of the aorta; in one from erysipelas and pneumonia; in one from secondary hemorrhage; and in the three other cases after amputation, there being in one of these cases also extensive disease of the heart, from which the patient died, while convalescent from the amputation. But there were also five other unsuccessful cases —viz., four in which amputation was performed with success, and a fifth in which the aneurism was known to have recurred two years after its apparent cure, but nothing is said as to its treatment then.

This makes the total number of cases in which the ligature failed when applied after the unsuccessful trial of pressure 13 out of 44,—a much higher proportion of failure than in those cases where the ligature was used at once; showing in the cases where the ligature was used after the employment of pressure, 29.54 per cent. of failures, as against 19.48 where no pressure was employed. This is contrary to the general belief, which is founded mainly on the statistics collected by Mr. Hutchinson, and published in the Medical Times and Gazette for Nov. 29th, 1856. Those statistics were founded on the result of only 76 cases in all, of which 54 were treated by compression; and of these latter 46 were popliteal aneurisms, 24 successfully treated by compression, and 22 in which the compression treatment failed, amputation being had recourse to in 3 cases (and in all successfully), while the femoral was tied in the other 19, with 5 deaths. These figures differ slightly from Mr. Hutchinson's own tabulation, since he has included in the general total a very few cases in which the femoral was tied for femoral aneurism, whilst I am here speaking of popliteal aneurism only ; but the same general observation applies to Mr. Hutchinson's own statement also—namely, that the figures are too small to bear the conclusion which has been based on them. They have been taken to show—and in this respect I must plead guilty along with other authors—that the treatment by compression has a favourable influence on the after-progress of cases generally, by enlarging the collateral circulation, and thus lessening the tendency to gangrene. From this cause it is held that the mortality after the ligature is lessened when it becomes necessary to tie the artery on the failure of compression. My own much larger numbers would show, to any one who trusts implicitly in figures, that, on the contrary, the mortality of the operation of ligature of the femoral artery in modern practice has proved considerably less than that which was deduced from the records of practice in the last two generations, and that the proportion of deaths in cases which, after having been submitted unsuccessfully to pressure, are treated by ligature of the femoral, is greater than the average mortality of cases treated by ligature at once.

The latter conclusion need not surprise us. It is quite true that the application of pressure will probably enlarge the collateral vessels, and thus diminish the risk of gangrene. But it will also have somewhat exhausted the patient, and it may have produced a certain amount of injury to the vessels at the part compressed; and these disadvantages are to be set against any advantage which may be gained by the enlargement of the collaterals. But what is of far more importance to the general result is the fact—which seems to me certain, though it is very difficult to prove it from the notes of cases—that pressure succeeds in the best cases in which it is tried, and fails in the worst. Hence the mortality is likely from the first to be greater in the cases of failure than in those of success. Allowing this, let us look at the total statistical result of the cases which I have collected.

Of the 77 cases treated by ligature at once, the deaths were 11, and the total number of failures 15 ; showing a percentage of 14.3 of deaths and 19.48 of failure.

Of the 124 cases in which the treatment by pressure was undertaken, success was obtained at once in 66; in 44 of the others the ligature was applied and succeeded in 31; making the total number of successful cases 97, and the total number of failures 27. Of these 27, however, only 14 died—viz., 1 of an accidental attack of *pleurisy*, 5 after amputation with no previous ligature, *and 8 after ligature. This* makes the percentage of deaths 11.3, and

that of failures 21.7. So that the total result of compression treatment, as compared with that of the method of Hunter, has been that the percentage of deaths after compression has been a little less, but that fewer cases on the whole were completely cured; there being rather more in which amputation was performed, and a few who withdrew themselves from all further treatment—a class which of course does not exist on the other side.

On the whole we may say that, allowing for accidental circumstances, the results of the two methods have been as nearly identical as is possible in a long series of cases extending over many years and a large variety of districts. And this, I must say, is to me a striking argument in favor of the more recent method.

When we heard, some years ago, on the first introduction of excision of the knee into general use, the statements which its advocates made as to its freedom from danger or any other drawback, and the abuse which was unsparingly heaped upon those who were somewhat reluctant to accept the new treatment as a proved advance on the old, we could not avoid doubting assertions which showed so little of the caution and moderation that ought to follow on experience in practice. Such rose-coloured views of operative surgery almost carry their own refutation. *Quodcunque ostendis mihi sic, incredulus odi.* So if I should come here to assert that the modern treatment of aneurism was free from all risks of failure, or that the Hunterian operation is other than a most efficient and successful method of treatment, I should feel that I was abusing your patience and doing little credit to the position in which you have placed me. The truth is that the treatment by compression very often fails, that it has difficulties from which that by ligature is entirely free, depending as it does on careful attention to a number of minute details on the part of the surgeon, and exacting sometimes from the patient prolonged submission to an irksome and distressing ordeal from which he knows he can withdraw himself at any minute. All this is quite different from the progress of a case after ligature. When once the vessel is tied the surgeon has little more to do in most cases, and the patient nothing. If the case does well, in fact, no further treatment whatever may be required; with the simplest dressing, or sometimes with no dressing at all, the wound is found healed, and the case is at an end.

That a method of treatment which has been so recently adopted into general use as that by pressure should have already attained the same amount of success as one which has been perfected by the experience of a century, during the whole of which time it has been the favourite study of some of the greatest surgeons of their time, is surely a most gratifying fact, and one which promises results still more successful. For we must remember that as we advocate the operation of excision of the knee in appropriate cases, in consequence of the prospect which it holds out of a more useful limb, although we believe that the danger is as great or greater than that of amputation, so we might fairly advocate the adoption of the compression treatment of aneurism in preference to the immediate resort to the ligature, even if we believed that the one was no more successful, on an average, than the other. For though the difference is not certainly so great between the limb after compression and after ligature as it is between the result of an excision and an artificial limb, yet it is a very great difference indeed. The ligature of the main artery of a limb leaves the member weakened, ill-nourished, and often prone to obstinate and hardly curable ulceration. The main artery is always obstructed at one part, and usually at two (viz., the seat of ligature and that of aneurism); and the indirect circulation can never entirely replace the direct. The cure by pressure (whether indirect or direct) does not necessarily involve any such obliteration, as these preparations from St. George's Hospital museum show (vi., 121–2, 126). And to this must be added the far more powerful consideration, that in successful cases of pressure the patient is exposed to no danger whatever, and sometimes to really no inconvenience; whilst such cases, instead of being exceptional, are really, I believe, the majority, provided that the treatment is undertaken at an early *period and the sac is* well formed and complete.

The results, then, of this table fully support, to my mind, the view which

I entertain, that the cure by pressure ought to be attempted in all ordinary cases of popliteal aneurism. When the sac is imperfect, or even very weak, it is better, I think, to resort to ligature at once; and if the aneurism is situated towards the knee-joint, or is rapidly growing, I do not advocate long perseverance in the attempt at compression; nor, indeed, do I think that in any case protracted compression is a benefit to the patient, or diminishes the percentage of failure.

These conclusions I believe to be justified by our present experience. But we must always remember that the methods of compression are being constantly improved. The triumphs of the rapid form of pressure under chloroform, the success of digital pressure, the rapid and painless cures sometimes obtained by flexion, are amongst our most recent experiences; and they are too striking not to attract all possible attention from practical surgeons, and to show that we do not know by any means all that may yet be accomplished by compression.

Most surgeons, of whom I am one, much prefer the digital to every other form of pressure when a sufficient number of really well-trained and trustworthy assistants can be obtained; while others, believing that digital pressure is liable to be unsteady and that it gives more pain, and having a perhaps exaggerated idea of its difficulty, prefer some form of tourniquet.

I shall speak first of digital pressure. The notes furnished to me from the various hospitals do not give any sufficient data for estimating the average success of digital compression, considered as the sole means of treatment. I find one case in which, after nearly complete cure by the tourniquet, four hours of digital compression produced complete consolidation. But, excluding this, there are only six cases in which it seems to have been the sole means of cure, out of the 66 successful instances of compression. The notes of these cases, as far as they go, show strikingly how much more rapid, and consequently how much less distressing, this treatment is when it does succeed. In one case the cure was obtained in sixteen hours, in a second in twenty-six hours and a quarter, in two others in thirty-six hours, in a fifth in three sittings of eight, sixteen, and ten hours each. In the remaining case the time is not given. There is also among the failures of compression one case in which, after twelve hours of digital compression, the surgeon, for some reason, resorted to the ligature (and with success), although the tumour was found to be somewhat harder. This very probably was not really a failure of compression; some accidental circumstances might very likely have made it inconvenient to prolong the treatment. All that we are entitled to say, then, from our hospital table, is that, though the treatment by digital pressure has come into general use in our hospitals too lately to be fairly reported on, yet such experience as we have had of it justifies the belief that, when well and carefully employed, it is a most efficient, rapid, and painless method of applying pressure.

The records of published practice are collected in the most accessible form by Fischer. He quotes and refers to 90 cases in which digital compression was used—either alone or in combination with instrumental pressure or flexion—for the cure of popliteal aneurism. Out of these 90 cases there were 17 in which instrumental pressure had been previously employed and had failed, and 3 in which flexion had been previously employed and had failed. In all these 20 cases the cure is attributed to the digital pressure only. There were also eight cases in which the instrumental and digital pressure were used simultaneously, and therefore no precise judgment could be arrived at as to the share which each had in the cure. The total result of these 90 trials of digital pressure as the chief or the only means of cure was as follows:—Digital pressure succeeded in 55 cases. Ligature was used in 23 (of which 14 were cured, 1 recovered after amputation, 1 was not cured, 1 result doubtful, and 6 died); 4 cases were afterwards cured by instrumental compression, combined in 2 with flexion; 2 were amputated, and both died; 3 cases were cured by injection of perchloride of iron, manipulation, and acute pressure respectively (but the latter case is an error, I think). In the remaining 3 cases no further *treatment* was adopted (as far as is known). This *gives out of the 90 cases—76* complete cures and 1 cure after amputation;

in which the treatment seems to have been given up; 1 where the result, after ligature of the femoral for varicose aneurism of the popliteal, is doubtful; and 8 deaths (6 after ligature and 2 after amputation). A ratio of 8.9 per cent. of deaths and 14.4 per cent of failures.

If we compare this ratio of deaths and of failures with those above given as prevailing after other methods of treatment—as for example, the Hunterian ligature, when used at once,—we do not see any very striking statistical proof of superiority, considering that digital pressure is not ordinarily used as the chief method of treatment in the worst cases. But, as I have often before remarked, the statistical method of reasoning is not really of much use as applied to the treatment of any given case. No one would stop to calculate averages in order to make up his mind what to do in any of the emergencies of practice. The statistics of digital pressure are nevertheless useful as showing that the treatment is one which is fairly successful, even with the limited experience hitherto obtained of it. A fairer view of the advantages of this form of pressure may be derived from considering some of the peculiar features of recorded cases.

There can be no question, in the first place, that the finger of a trained and intelligent person is a more discriminating, more accurate, and less distressing agent for stopping or checking the circulation than any form of instrument, however ingeniously devised. The femoral artery, as it lies in the groin, side by side with its vein and in close proximity to the bone, can be easily commanded, in a thin or even in a moderately stout person, with little expenditure of force, with an almost total absence of pressure on the vein, and usually without much pain, provided that the person compressing knows how to make the pressure. Now all these points are of great importance, and they together constitute a very great superiority for digital as against instrumental pressure, considered with respect to its facility of application only.

In the first place, the slight force which is required to command the femoral in the groin renders it easy for the patient to undertake his own treatment when necessary. This is now illustrated by so many examples, and is so well recognised as a means of treatment for patients who have the necessary intelligence and resolution.

Again, we have in digital pressure in the groin a far more efficient method of avoiding that compression of the femoral vein along with the artery which has so unfavourable an influence on the course of many cases of instrumental pressure. However dexterously a tourniquet pad may be adjusted and maintained, it is, I believe, utterly impossible not to press to some extent on the femoral vein, even in the groin, where the two vessels are lying side by side; although possibly the whole flow of blood through the vein may in some cases not be obstructed; and the high authority of Dr. Bellingham may be quoted in support of this view—that instrumental pressure cannot be so managed as to avoid the vein, even where the vessels pass over the pubes. And lower down, where the vein inclines more and more to the deep surface of the artery, the simultaneous obstruction of the two vessels becomes still more inevitable and still more complete, so that low down in the thigh the pressure which obstructs the artery acts, it is probable, first on the vein; and if the arterial circulation is to be suspended, that in the vein must also be totally stopped. Now the pressure of a tourniquet pad influences the skin over a considerable surface; and in order to vary the point of pressure, the alternating pads must be applied at a considerable distance from each other, changing from the groin to about the middle of the thigh. Thus, much interference with the venous circulation is unavoidable in instrumental pressure. The finger, on the contrary, can select and isolate the artery in the groin with perfect ease. It can be pressed down on the vessel from the inside, insinuating itself between it and the vein, and so avoiding all pressure on the latter. And the point of pressure can be changed frequently, though only to some little distance, where the vessels have much the same relations to each other, above the origin of the *profunda*. The point to which Mr. Walker, of Liverpool, has directed attention is also worth bearing in mind—viz., that by varying the point of pres-

sure from the common to the superficial femoral, we are, in reality, changing the course of the anastomosing circulation. He urges, therefore, the importance of what he calls "the one-artery system" of pressure, and this is certainly easier the smaller the compressor is.

It appears decidedly desirable on all accounts to interfere as little as possible with the vein. Cases are not wanting to show that the vein is often permanently obliterated after pressure: on which point I would refer to M. Verneuil's paper in the Gaz. des Hôp. for 1859. And besides the possibility of actual obliteration of the vein at the point of pressure, there can be no doubt of the injurious effect of that engorgement of the whole limb which is often caused by its temporary or incomplete obstruction, and therefore of the great advantage of any plan which can be limited, as far as possible, to the artery only.

In practice digital pressure has been found to be far less painful than that by tourniquets of whatever construction, and less painful also, as I believe, than that by the weight, though I have often seen this borne with little distress. This depends chiefly, as it seems to me, on the care with which it can be graduated, so that no unnecessary force whatever is employed. If two well-trained assistants act together—one observing the pulsation while the other compresses,—the stoppage of the pulse can be effected with the minimum of force, and occasional intervals of repose can be given to any portion of the skin which is becoming irritated.

Vanzetti records a case in which the pain in the aneurism, which had been very acute, was at once relieved by digital pressure; Mr. Holt one in which the patient slept during the application of the pressure.

Fischer refers to 17 cases in which instrumental pressure was so painful that it had to be given up; and in 11 of these digital pressure was successfully carried out. In Broca's work 29 cases are given in which instrumental pressure was intolerable—in fact, the invention of digital pressure seems to have been due in great measure to the pain caused by the instrument.

The applicability of compression in cases of disease of the artery itself is a circumstance which should never be lost sight of, and which is illustrated by numerous examples in all parts of the body. Thus the striking case of axillary aneurism under Rizzoli's care which I narrated last year, and in which the subclavian could be felt enlarged and hardened by atheroma, could never have been treated with any hope of success by ligature, but was cured by pressure.

An interesting example in the case of popliteal aneurism is quoted from Gallozzi by Fischer. Here there was a popliteal aneurism, which is said to have been "diffused," of the size of the fist, and the femoral artery could be felt, atheromatous, as high as the external iliac. Continuous digital pressure for nine hours took away the pain in the tumour, and next day the disease was cured.

Such pressure is far more safely applied by means of the finger than by any tourniquet, since it is of the last importance not to use any excess of force over an atheromatous or ossified artery.

The rapidity of the cure in digital pressure is one of its great advantages, closely connected with the less force which it requires and the less pain which it produces. The patient is thus enabled to bear the prolonged application of an efficient amount of pressure, and cure is often produced with astonishing rapidity.

In Fischer's tables an average has been struck of the length of time occupied in the treatment of the successful cases of digital and instrumental compression respectively. This table refers to aneurisms of all the various arteries of the body, but we may apply its general conclusions to popliteal aneurism only without risk of error. It shows that 34.7 per cent. of the cases of digital pressure were successful in the first twenty-four hours, while only 10.1 per cent. of those of instrumental pressure were so; and 86 per cent. of the former recovered in the first fortnight, against 53 per cent. of the latter. The mean time required for cure in the list of cases of digital pressure was about three days, and of instrumental pressure about fourteen days.

Digital pressure is commonly spoken of as being much more difficult to carry out properly than instrumental pressure is. On that subject I am very far from being convinced. It is true that it takes little trouble to have an instrument screwed on, anyhow. But to apply instrumental pressure really in an efficient manner, constant care is necessary, and the patient ought to be watched by the surgeon himself or some perfectly competent assistant during the whole time of treatment. This constant supervision during a much longer period may certainly counterbalance to a great extent the physical labour of the manual pressure.

The difficulty in making effectual digital pressure varies much in different cases. Some persons have more knack as well as stronger fingers than others, so that one man will suppress the pulsation with ease where another can only do so with great labour; and usually the inconvenience to the patient varies with the trouble to the attendants. Pressure which is easily applied is also, as a rule, easily borne. Lay assistants must be carefully instructed in the method of applying pressure, and in the direction in which the artery is most easily caught; and, if possible, it is well to combine a professional assistant with each. Assistance is sometimes usefully given to the compressing finger by a weight laid upon it, as recommended by Mr. Holden. He says, in reporting a case of successful digital pressure in popliteal aneurism (combined, however, with instrumental): "We devised a plan of assisting the fingers by superimposing a weight upon their ends. The weight consisted of a long slender bag filled with 12 lb. of shot. By this means we saved muscular force, and enabled the fingers to act for nearly two continuous hours, without any fatigue or inconvenience except a little numbness over the nails." On this plan thirty hours of continuous pressure were perfectly well borne. The pressure was then left off, as the aneurism appeared cured; but the symptoms recurred in about twenty-six hours, and ultimately the cure was completed by instrumental pressure. Mr. Holden remarks that, had the pressure been kept up for forty hours instead of thirty in the first instance, it would in all probability have been completely successful.

Unless some such assistance is given to the fingers, few persons can keep up pressure efficiently for more than about ten minutes or a quarter of an hour; and it is necessary, therefore, to organise a staff of compressors, who take charge of the artery in pairs—one pressing while the other watches the aneurism, and changing as soon as the fingers become at all tired or unsteady, care being taken that the artery is not released from pressure as the hands are changed.

Digital pressure should always be made with sufficient force to stop the pulsation of the tumour, and no more. The plan of allowing a perceptible amount of circulation to go on through the tumour, which was a favourite one in my younger days, and was recommended by the Dublin surgeons, is now, I believe, allowed not to have any advantage. It is quite possible that some blood may be really passing through the aneurismal sac, even though no pulsation can be felt; but however this may be, it is certain that the total obliteration of pulse in the aneurism does not retard, but, on the contrary, greatly hastens the cure, and that in some cases the disease has been cured in a very short time. The shortest times which I have found assigned to the cure of a popliteal aneurism are in the following cases. One, under the care of M. Sernin Fontan, where the tumour (the size of a goose's egg) became quite solid after three hours and a half of compression, though pressure was continued as a precaution for four hours more. The permanence of the cure was verified in this case. Dr. Mapother has related one which was cured in five hours and three quarters. Mr. Bryant's patient above alluded to cured himself in four hours and a half. In Blackman's case the patient was cured by three hours of compression in the groin. And the shortest time of all is one of Vanzetti's cases, where only two hours and a half were consumed in the treatment.

Such very rapid cures will, of course, be only seldom met with, but the averages stated above show that in about one-third of the successful cases the cure has been obtained in the first twenty-four hours. Now it is almost always possible to keep up continuous pressure for this length of time in any

patient who is not too irritable to bear pressure at all. And if so kept up properly, I have no doubt most cases would either be cured or in a fair way of being so. But when the attempt has been carried on for this length of time without success, it must in general be suspended from exhaustion of the patient or of the assistants, and now it may be advisable perhaps to supplement it with instrumental pressure, or to use digital pressure in the intermitting manner for about two hours at a time twice a day. The sac will by this time probably have become well lined by fibrine, so as not to yield to the distending force of the circulation when re-admitted, and fresh accretions will be added with each compression, until the whole tumour is obliterated.—*Lancet, May* 1 *and* 8, 1875, *pp.* 599, 637.

42.—ON LIGATURE OF A MAIN ARTERY TO ARREST ACUTE TRAUMATIC INFLAMMATION.

By C. F. Maunder, Esq., Surgeon to the London Hospital.

[The idea of applying a ligature to the main artery of a limb for the cure of acute traumatic inflammation was suggested by the fact that compression to the vessel had been so applied.]

Supposing compression to be resorted to, and, for some reason or other, to be relinquished too soon, blood would then not only pass to the inflamed spot through the enlarged smaller vessels, but also through the main channel, and thus an additional and injurious supply would be added.

On May 13th, 1866, I recommended the ligature of the femoral artery in a case of wound of the knee-joint followed by traumatic fever and acute inflammation below, about, within, and above the knee. The man who had sustained the accident was under the care of my then much-esteemed colleague, Mr. L. S. Little; and that gentleman tied the superficial femoral artery, with immediate and striking relief to symptoms. The patient, who was in imminent danger of losing, possibly, both limb and life, was from that moment in comparative safety, and made a good recovery.

Lacerated wound of the knee-joint; acute inflammation; ligature of superficial femoral artery; immediate relief; recovery.—Joseph C. was admitted into the London Hospital, under the care of Mr. L. S. Little, on May 3rd, 1867, having sustained a lacerated wound, opening the knee-joint. When seen by Mr. Disney Thorpe, the house-surgeon, an hour after the accident, synovia was escaping. The wound was closed with three silver sutures, a back splint was applied, and the joint surrounded with bags of ice. He passed a good night without pain. The next day there was some effusion into the joint; but there was no heat nor constitutional disturbance.

May 5th. Effusion less; patient very well. Ice to be continued, as he complains of pain if fresh ice is not frequently applied.

6th. So well that he was placed upon full diet.

11th. There is some redness along the inner side of the knee, and some pain.

12th. Knee-joint much increased in size, red, and tense with fluid. Great and incessant pain, which is much aggravated if the joint be touched.

13th. Joint still more swollen. It feels hot notwithstanding the continued application of three large bags of ice. The redness has extended some distance up the thigh, particularly on the inner side, where the tissues are brawny, also down the leg. The patient is suffering much from pain and sleeplessness, with a pulse of 120, anxious countenance, and general constitutional disturbance. At 10 a.m. he had a rigor. I now saw the patient in consultation with Mr. Little, and proposed the ligature of the superficial femoral artery as a means of arresting the inflammation. Mr. Little, courteously acting on my suggestion, boldly and dexterously tied the artery at once (4 p.m.) at the *apex of Scarpa's triangle*, the patient being under the influence of chloro-

form. The redness paled somewhat at once; and the patient, on recovering from chloroform, remarked, with surprise and delight, "my pain is gone." Half an hour after the operation the pulse was 100, having previously been 120. 10 p.m.: No pain since operation. Thinks he'll sleep. Pulse 96; less redness; toes cold, but sensible to touch.

14th. 4 p.m.: Toes warm; knee cooler and less red, but with a sense of numbness about it; pulse 90, feeble. To have six ounces of wine.

15th. 3.30 p.m.: Says he is "first-rate;" better appetite; heat about the heel prevented sleep (pressure from splint); knee and thigh smaller and paler; the ends of the accident wound began to discharge very thick pus about two hours ago; pulse 100, firmer; tongue cleaner.

16th. 4.30 p.m.: The patient had some starting pains during the night, so that he slept badly. As the discharge from the knee was now considerable, the quantity of wine was increased to ten ounces. Pulse 98.

17th. During the night he had a profuse sudden bleeding from the nose.

June 1st. Ligature removed to day. Has gone on uninterruptedly well, with the exception that the wounds have been very slow in healing, and showed little power, particularly that on the thigh, which discharged very freely.

June 26th. Sat up to-day.

P.S. The patient gradually regained the use of his limb, and acquired free motion to the extent of 20°. Three months after the man was quite well, but the range of motion appeared to be limited by thickening outside the joint. He refused further interference, as he can do his work satisfactorily. He is here to-night.

I need scarcely say that when this idea of mine had been put in practice (1866) with pre-eminent success, it created considerable discussion in the profession, and many surgeons came to see the case. Since that time certain articles on inflammation published in this country have advocated this as one of the methods of treatment. Mr. Bryant says "To arrest acute inflammation in the limb, the deligation of the main artery of the limb, or the arrest of the circulation through it by pressure upon the artery, has been adopted. Dr. Campbell, of New Orleans, speaks highly of the practice, and even affirms that no portion of an extremity should be amputated for destructive inflammation without the surgeon attempting the practice. Upon the suggestion of Mr. Maunder, of the London Hospital, in 1867, Mr. Little applied a ligature to the femoral artery for acute suppuration of the knee, with a success sufficient to prove its value; and the late Mr. Moore, of Middlesex Hospital, acupressed the brachial artery with a good result." Dr. Robert Druitt in his article "Inflammation," naturally jealous for originality emanating from his own countrymen, says: "Mr. Maunder, of the London Hospital, has tied the femoral artery in several instances of severe inflammation of the lower limb, and has spoken favourably of the results. Mr. Maunder's first case was so treated by him without any knowledge of the American experiences we have referred to, and his results were as satisfactory as those of Dr. Campbell. The late Mr. C. H. Moore also compressed the brachial artery for severe traumatic inflammation of the hand, acting on Mr. Maunder's suggestions, and in that case also the remedy had a very striking effect."

The advantages I claim for the ligature are best shown by a review of the above case. Immediately on the application of the ligature, pain, previously severe, ceased; and with this cessation sleep and appetite returned. On the following day the countenance was changed from one expressive of physical suffering to that of repose, and in forty-eight hours the man pronounced himself to be "first-rate." Symptoms of inflammatory action, both general and local, quickly subsided—redness paled, swelling disappeared, and the integuments, previously rendered red and œdematous above, about, and below the knee, soon assumed their normal character. On the day of operation Mr. Little and I were not sure whether or not pus was already formed (the man had experienced a slight rigor in the morning), but inclined to the opinion *that a small quantity* did exist immediately under the skin and middle of the *line of the wound*, which was healed. We also thought it quite probable *that the synovial* membrane of the joint had already begun to secrete pus.

About forty-eight hours subsequent to operation, both ends of the original wound opened spontaneously and discharged pus, the matter flowing in small quantity, and as though it welled up from the interior of the joint. During this suppurative stage the patient experienced no discomfort, with the exception of slight starting pains for one or two nights, and after the lapse of a few days, the discharge of pus, except from the surface of the accident wound, ceased. Another and all-important advantage is, that no blood is taken from the patient; and the subject of these remarks was in no condition to lose an ounce of the vital fluid.

Since then I have tied a main artery twice, with a view to arrest inflammation in a limb, and my colleague, Mr. Reeves, has ligatured the superficial femoral with a similar object. Also, in several instances in which the ligature has been used to stop bleeding, existing inflammation has ceased, and repair commenced. The first of the former was that of a child whose knee-joint had been opened by a burn.

Open knee-joint; suppuration within and without; ligature of the femoral artery; recovery.—A. P., aged three years and a half (Case 12 in Table of Arteries), was admitted into the London Hospital, under the care of Mr. John Adams, Feb. 5th, 1869. She had sustained a severe scald by boiling water over the lower part of the abdomen and thighs, and especially of the right knee. She progressed favourably for several weeks, when, on April 8th, the house-surgeon, Mr. Vialls, observed an abscess on the outside of the knee, which broke on the following day.

April 10th. The patient had recently come under my care (by reason of Mr. Adam's retirement from the office of surgeon). At the site of the abscess a depression in the granulations admitted the little finger into the joint. The cavity contained pus, and an incision made on the inside favoured its flow.

19th. Suppuration has spread round about the joint, and up and down the limb, and incisions have been made here and there. A drainage-tube was introduced to-day through the joint.

28th. Limb is more swollen, and two more incisions are made. The discharge is very profuse, and the limb is dressed twice daily in consequence. Drainage-tube removed. Eats and sleeps pretty well.

29th. The whole limb is now œdematous from groin to toes, and pus can be squeezed out in large quantity at the various openings made from time to time. The child is very exsanguine and emaciated, but takes its food fairly, sleeps pretty well, and has a clean tongue. 8 p.m.: I placed a fishing-gut ligature on the superficial femoral artery at the apex of Scarpa's triangle on the antiseptic plan, everything coming in contact with the wound having been treated with a solution of carbolic acid. The ligature was cut short, and the wound closed by three metallic sutures and then covered in with layers of lint soaked in carbolic glycerine. The whole limb was carefully wrapped in cotton-wool, and a flannel bandage and splint applied to secure immobility at the knee. A large piece of lint saturated with carbolic glycerine was laid upon the thigh. There is nothing special to record concerning the operation. The vessel was deep by reason of the swollen state of the integuments, and a nerve larger than usual crossed the sheath towards its inner side; the femoral vein was not seen, and not a teaspoonful of blood was lost. The toes looked white and tallowy after the ligature of the vessel. 9 p.m.: Child is asleep; cries when the toes are touched, but moves them freely, they having very much the same appearance as the toes of the opposite member, and are equally warm to the hand.

30th. 3 p.m.: Sitting up; clean tongue; no appetite; strong odour of carbolic acid; much less discharge; toes colder than those of opposite foot. To have six instead of three ounces of wine. To use as little carbolic acid as possible, lest it affect the child's general health injuriously, which it already probably has done.

May 1st. Clean tongue; has eaten a little meat to-day. Removed the flannel bandage and cotton-wool, and pressed out matter which had accumulated since the operation. Incised a fluctuating swelling, giving exit to pus which *existed at the time of operation*, on the inside of the knee. The whole

limb, excepting the operation wound, dressed from the foot upwards with strips of lint. Wool and bandage reapplied and a back splint adapted.

2nd. (only seventy-two hours after operation). Nurse says the discharge is only a quarter as much as it was formerly. All swelling has subsided. Relishes food.

3rd. Feeds pretty well. There is a vesication on the heel (from pressure). The little pus discharged from the various wounds is very *thick* in character.

7th. On exposing the operation wound to-day it was found gaping and granulating, the sutures being detached by ulceration, but there was no discharge. The child takes milk, wine, eggs, and bread-and-butter freely, but very little meat. There is *not a tablespoonful* of discharge from the whole limb, now only the ninth day subsequent to operation.

It will thus be seen that the operation was markedly successful, the quantity of discharge being reduced to one-fourth. Subsequent to the ligature a small slough from continuous pressure formed on the heel, and I was very anxious about it. To my surprise the slough separated, and the wound healed as readily as though the normal circulation of the limb had not been interfered with. The child made a good recovery, although naturally weakly and the subject of ophthalmia, for which it was treated by my colleague, Mr. James Adams.

Question of operative interference.—With reference to the history of the case up to the time of operation, it was evident that the progress of the condition of the limb was from bad to worse. In the first instance, when the joint was found to have been opened, swelling and suppuration seemed to be restricted to its interior, but soon these limits were overstepped, and pus was found round about the joints on all sides. To give free exit to this, incisions were made, and a drainage-tube was passed through laterally, one end of the tube appearing on the inside of the articulation and the other in the popliteal space, to give exit to matter existing in that locality and to favour gravitation. The original wound on the outside of the joint allowed the matter to escape in that region. In the course of a few days further incisions were necessary above the knee, and on the day before operation matter had burrowed half-way up the thigh and half-way down the leg, and an incision in both situations gave exit to a large quantity of offensive discharge. On the day of operation the whole limb was œdematous, probably as a prelude to, or co-existent with, further diffuse suppuration.

Now, although the child's general health was fair, still the local symptoms threatened to become worse rather than to improve; and if the former state resulted, not many days would elapse before either hectic or typhoid symptoms would arise, when in the former case proximate safety would be in amputation, but in the latter there would be no hope of recovery. By ligature of the femoral artery I hope to save both life and limb.

By resorting to the ligature, I of course believed that suppuration would in great measure be arrested, and that amputation or death, necessitated by exhaustion, would be prevented. Also, I am of opinion, of two evils—profuse suppuration or ligature—I had selected the lesser; because I have not that dread of the consequences of ligature of the superficial femoral artery, under certain conditions, which some surgeons profess. I was greatly induced to operate in this case in consequence of an observation made in Mr. Little's case just related. A few hours before Mr. Little operated his patient had had a rigor, and we were led, from certain symptoms, to suspect that suppuration had already taken place in the joint, the original wound being at this time closed. In this suspicion we were probably correct, because, although both local and general inflammatory symptoms declined immediately after the application of the ligature in the most decided manner, still, some forty-eight hours subsequently, the original wound reopened, and the *thickest* possible pus flowed, or rather oozed up, evidently from within the joint. This thick pus was made up of just enough liquor puris to make it a soft solid —a condition due, I thought, to the withholding of fluid from the limb by the ligature on the artery.

The two preceding cases will contrast well with the following, in which *ligature of the brachial* was performed apparently to little purpose only.

Case 18, in Table of Arteries, was one of acute inflammation of the hand, in a middle-aged female, consequent on a poisoned wound. The whole hand was enormously swollen, with the fingers bent upon the palm. Her temperature was 103°, and the patient was greatly exhausted and had a dry brown tongue. Just above the wrist was a patch of redness, as though suppuration either had already or was about to set in. I tied the brachial artery in the *middle* of the arm, but it is most essential to notice that the effect upon both local and general symptoms was very slight when compared to the alteration for good with ligature on the main artery in the *lower* limb. Pus formed above the wrist, but the palm escaped and the fingers were no longer flexed. The patient died two months later of pyæmia. In the future, should the necessity arise, I would ligature the brachial artery close to the axilla, in order to get above the origin of the *profunda* branches, with the view of still further diminishing the supply of blood to the hand. The arterial anastomoses about the elbow are so numerous that, although the brachial be tied about its middle, its effect upon the blood-supply to the hand will sometimes be too transitory for my purpose, as regards inflammation, but highly conservative with respect to the vitality of the part, as the subjoined show. I tied the brachial for false aneurism, in a young man (Case 16). A good radial pulse existed next day. Also in a man aged sixty-six (Case 13). There was a pulse at the wrist on the third day.

The fourth case known to me is that of a male adult who had sustained an incised wound opening the knee-joint, associated with severe venous hemorrhage. The bleeding was arrested with difficulty, and violent inflammation of the joint followed. I saw the case in consultation with Mr. Reeves on August 3rd, 1870, and advised ligature of the superficial femoral. The man was extremely exhausted and wasted, and for days no hope of saving him by amputation had been nor could now be entertained. The discharge was most profuse both from the joint and thigh; perspirations copious; temperature 103°; pulse 135; and a large patch of redness had lately arisen over the front and inner side of the articulation. The benefit derived from the ligature in this case was almost ephemeral. The man ultimately died.

I shall now give you some American experience. I have received, through the courtesy of Dr. G. C. Blackman, of Cincinnati, U. S., a *résumé*, published by him in the Cincinnati Lancet and Observer of February, 1868, of the cases of traumatic inflammation treated in that country by ligature of the main artery, and which are well worthy of careful study. I will condense the information that I have gleaned. Up to this moment no one had hinted in any way that the operation had previously been performed. It was utterly unknown in this country. It appears probable that the femoral artery was ligatured for wound of the knee-joint, first by Henry U. Onderdonk, M.D., in June 1813; and that the patient was cured. A similar case was so treated by Dr. David L. Rogers of New York; and in this instance "the man got well by the twenty-fifth day." Dr. Rogers also refers to a case of compound dislocation of the ankle, in which Dr. Mott tied the femoral artery; but the patient died of tetanus. Dr. Rogers is of opinion that "the danger of mortification from defect of circulation is less than might be supposed" (and that has long been my opinion). "A lad sixteen years old, was the subject of a most severe and extensive gunshot wound of the arm. The brachial artery was ligatured high up, and although little hope was entertained of saving the arm, to the astonishment of all who saw the case there was merely sufficient inflammation in the wound to produce healthy suppuration and granulation. He recovered rapidly." Dr. H. F. Campbell, of Georgia, speaking from personal experience of six cases, is also a strong supporter of the principle. Dr. Daniel F. Wright, formerly of Winder Hospital, Richmond, records a case of gunshot wound of the thigh, followed by hemorrhage, and treated by ligature of the femoral at the apex of Scarpa's triangle. "The injured limb was for some days slightly colder than the other, notwithstanding which the condition of the wound commenced improving from that day." A second case was one of gunshot wound of the middle finger, requiring amputation. Gangrene set in, and spread rapidly; hemorrhage occurred twice, and *then the brachial artery* was ligatured in the lower third of the arm.

Improvement in the wound commenced at once. A third case is one of gunshot wound of the thigh, followed by spreading gangrene and repeated hemorrhage. The femoral artery was tied at the apex of Scarpa's triangle, and "the wound healed more rapidly than any lesion of such extent that I have ever witnessed." Two other cases are recorded by Dr. Wright, but were not immediately under his care. The brachial artery was tied in both instances "with a result exactly similar to that in the cases already detailed." Dr. Wright remarks: "In the five cases witnessed by myself, and in the six cases reported by Dr. Campbell, we have this uniform result—that, immediately from the date of ligation, large tumefaction has been superseded by recovery of the original contour, fetid ichorous discharge by laudable suppuration, and phagedænic gangrene by vigorous granulations, resulting in rapid separation of the eroded tissues. . . . . In all the instances I have given, though the ligature resulted in curing the gangrene, it was not resorted to for that purpose, but for that of arresting hemorrhage. In the present state of professional opinion it would be bold surgery, savouring perhaps of rashness, to tie the brachial artery for gangrene of the hand, or the femoral artery for phagedænic erosion in the calf of the leg; though my friend Dr. Campbell does not stop short of advocating this very procedure." Also Dr. D. L. Duvall remarks that, in a paper published at Richmond by Dr. S. P. Moore, Surgeon-General of the Insurgent States, the author stated "that he had performed operations on patients whose limbs, after being wounded, presented all the indications of rapidly approaching gangrene from inflammation, when, fortunately for the patient, extensive hemorrhage ensued, which necessitated the ligature of one or more of the large arteries of the limb, and, to his great surprise, rapid improvement began and the patient recovered." Velpeau too appears to have given this method of combating inflammation his consideration, and in the American edition of his great work on Operative Surgery (vol. i., p. 649) says:—"As compression of the arteries moderates, and even arrests, the circulation of the organs situated underneath (beyond ?), it seems at first sight to constitute an excellent remedy in congestions, engorgements, and acute inflammations of all kinds. It is therefore somewhat surprising that physicians should, for so many years, have omitted to make use of it under this point of view. At the present time (1839) the mind appears to take another direction; and compression of the arteries, if we are to believe its partisans, should become the sovereign remedy in convulsions, epilepsy, inflammation of the limbs, &c."

However pathologists and physiologists may explain inflammation, however complex may be the process, whatever share in its production may be ascribed to the vascular system, to the nervous system, and to the tissues themselves the seat of it, I presume all will admit that an excess of blood is brought to the part. The experience of practitioners in the healing art had from time immemorial taught the value of the withdrawal of blood as a remedy for certain inflammations. Thus we have arteriotomy, venesection, the use of leeches, &c. But all these methods have this disadvantage in common—they *remove* blood from the system. Obstruction of the main channel, on the other hand, only *withholds* it from the inflamed part, and may be likened to dry cupping, by which the blood is diverted into other channels *temporarily*, and thus the inflammation is, as it were, starved. Lawrence says: "Blood is the material by which the increased action of the part is maintained. In the figurative language, which the obviously increased heat has suggested, one may say that it is the fuel by which the fire is kept up. If one could completely command the supply of blood, the increased action might be effectually controlled or arrested."

In considering the propriety of placing a ligature upon a main artery with a view to arrest acute traumatic inflammation in the part beyond, various questions must be entertained. First, the *possible* and *probable* result, if the case be treated on general principles hitherto accepted; secondly, the effects of the ligature (upon arteries such as the femoral and brachial) *immediate*, *intermediate*, and *remote*. On the other hand, in contemplating, in not a few *instances, the effect* of acute inflammation, of the knee-joint for example, *subsequent to a wound* of the same, the prospect is not at all cheering; and

I know of no case in surgical practice of injury to a limb, not requiring immediate amputation, which excites more anxiety in the mind of the surgeon for the welfare of his patient than traumatic inflammation of this joint. Its effects, both local and general, are quickly manifested. Swelling, redness, and pain, precursors of suppuration, attack the joint and the limb both above and below, while traumatic fever runs high. After the lapse of a few days pus is formed in and about the joint, and for weeks, while the articulation is being destroyed, suppuration spreads and burrows up and down the extremity. During this period the patient's powers, both nervous and vascular, are becoming exhausted by pain and loss of sleep and appetite, consequent on the progressive destruction of the joint structures, as well as by the more or less profuse suppurative discharges. All this time, too, he has been exposed to the risk of erysipelas and pyæmia; and at length, to escape death from hectic, he submits to amputation, with a poor chance of recovery.

W. D., twenty-eight years of age (Case 17, Table of Arteries), became the subject of acute suppuration and sloughing of the soft parts of the hand and forearm, and disorganisation of the wrist-joint, associated with recurring hemorrhage. To prevent further bleeding, and to remove structures damaged beyond useful repair, I advised amputation; but the patient declined, and I was obliged to be content with ligature of the brachial artery. He died of pyæmia on the eleventh day. No sooner had the operation been performed than inflammatory symptoms abated: swelling disappeared; suppuration, which had been profuse, was reduced to a minimum; sloughing ceased, and granulations quickly arose. I must say I was somewhat surprised at this beneficial result of the ligature, for the parts were so damaged by the previous inflammatory action, added to the injury, that I thought it likely gangrene rather than repair might result.

But it sometimes happens that the result of such an accident is still more disastrous, the patient dying after weeks of suffering in possession of the damaged limb, because no opportunity for amputation, with the hope of a successful result, had presented itself.

H. P. (Case 9), a man aged forty-seven, was admitted on March 9th, 1867. He had sustained a severe squeeze of the knee. Suppuration up and down the limb and disorganisation of the joint followed; but the man was too ill to be submitted to amputation, and he ultimately died of hemorrhage.

On the other hand, and under the most favourable circumstances that can be anticipated, the prospect is gloomy. A patient may recover with his joint more or less anchylosed and distorted, and the limb more or less useless in proportion to the degree in which its various component parts have been involved in the inflammatory process.

Peter J., aged twenty, was admitted on November 6th, 1873, having received an injury to his left knee ten days before. In about a fortnight after the accident the knee-joint was laid open, and a large quantity of pus came from it. He was in the hospital six months, during which period very many incisions were made here and there to let out the matter, and drainage-tubes were used from time to time. For many weeks from three-quarters to a pint of pus was discharged twice daily. He ultimately recovered, with anchylosis. You will presently see this patient, but I fear you will be able to form a very inadequate idea of his former condition judging from his present shapely and useful limb. This happy result is due to the great care and attention bestowed for weeks and months upon the case by my house-surgeons (Messrs. Mitcheson and Kershaw) and dressers (Messrs. Jones, Treeves, Needham, Snell, and Harvey).

It would be out of place to discuss here the treatment of disorganised joints with a view to prevent displacement of bones and consequent inutility. Suffice it to say that, in the instance of the knee (a joint especially liable to luxation) that you will see to-night such unpleasant accident has been prevented, and, anchylosis being necessary, the proper angle (a most essential point for the patient's comfort in progression) has been attained.

John P., aged twenty-seven, was in the hospital at the same time as the former patient. Incisions about the joint were made, and a drainage-tube was used once. The inflammatory action of a comparatively mild character

was more restricted to the neighbourhood of the joint than in the former case. From time to time a fresh attack of inflammation occurred, and these kept him in the hospital almost as long as the above patient who suffered so severely. Even now, twelve months since he left the hospital (March 18th, 1873), the limb has not recovered itself, while that of his fellow-sufferer is most useful. In this case an excess of synovia was the chief secretion from within the joint, associated with a little suppuration outside the capsule. You will see that the man has a firmly fibrous and anchylosed joint; and he is an example of the injurious influence of a constitution spoiled by intemperance, upon local injury.

In rare instances—so rare, indeed, that they can scarcely be allowed to influence our prognosis—the patient escapes with a comparatively sound joint. A. B., about eighteen years of age, sustained a blow upon the knee, followed by suppuration within the joint. This was evacuated by an incision on the outer side, and the patient was quickly well. The girl has perfect use of the articulation.

I especially invite your attention to these three patients to-night, because they were all under care at the same time, under the same roof, under the same surgeon, under the same atmospheric and hygienic conditions; but differed in one grand and all-important feature—in constitution. Each illustrates a stage of the disease which it is important to recognise during its progress, with a view to prognosis. The young woman has recovered, probably without a trace of the result of the injury existing to-day; the young man (of intemperate habits), while showing comparatively slight signs of local mischief, suffered severely in his general health, and even now repair is not complete; but the patient whose limb it seemed, to most who saw it, impossible to save, and which was twice condemned by my experienced medical friend, Mr. Stilwell, of Epsom, survives. It will be difficult even for those who saw him at his worst, and almost impossible for any who never saw him, to credit the transformation. The reasons of my withholding operative interference—either ligature of the femoral or amputation—were, his cheerful and hopeful disposition, a clean tongue, good nights, and never-failing appetite. But, above all, although the cartilages were destroyed early in the progress of the case, and the articular ends of the bones were exposed, these latter never became involved in the inflammatory process, and he was always free from "starting" pains. This symptom is evidence of disease which very often leads to operative interference, occasionally to death. On the other hand, we had to combat a most profuse discharge coming from all parts of the limb, and a disorganised knee-joint. (It will be out of place to discuss here, in connexion with profuse suppuration, how far a large supply of aliment favours this; but I think it worthy of consideration whether or not we overfeed some patients.)

The picture I have drawn, I believe truthfully, of the probable consequences of traumatic suppurative inflammation of the knee-joint is very discouraging. Can we hope for better things from ligature of the main artery? I think I have proved it.

I will now consider the possible effects—immediate, intermediate, and remote—of ligature of the vessel.

The *possible immediate effect* is gangrene of more or less of the limb, varying from the shrivelling of a toe to death of the whole leg as high as the ligature. But this is scarcely likely to happen, because, an excess of blood having been now sent to the part, the collateral circulation may be regarded as already in some measure established. Case 21-22 in the Table of Arteries, a female aged forty-nine, in a very depraved state of health, and the subject of diffuse cellulitis with extensive sloughing about one foot and ankle, was submitted to ligature of the anterior and posterior tibial arteries of the same side, to arrest recurring hemorrhage, she at the time being too weak for amputation. The acute symptoms subsided at once, and hemorrhage did not recur. She soon died, and the whole foot and ankle seemed to have lost their vitality; but whether any part of this was due to the ligature it is *impossible to say*, sloughing having already commenced previous to the operation.

The *possible remote effect* is a permanent weakening of the limb, rendering it less valuable as an organ of progression, and, by lowering its vitality, making it less able to bear changes of temperature or to resist and repair injury and disease. I must repeat, as worthy of special notice, that in the case of the child already mentioned, within a week of the operation a slough formed on the heel from direct pressure. Knowing how slowly such accidental wounds often heal, I feared that in this instance it would be slower still. I was agreeably surprised to find that my anticipations were not realised; the sore closed quickly.

The *possible intermediate effect* is hemorrhage at the seat of ligature, from either the proximal or the distal side. (The former complication requires a reopening of the wound, and search to be made, under difficult pathological conditions, for the bleeding orifice, that a ligature may be reapplied; or, if this cannot be accomplished, the trunk of the vessel must be exposed as near as practicable to the bleeding point, and a thread be passed around it. The latter accident will probably be combated by a well-applied graduated compress and bandage.) This subject was fully discussed and illustrated by cases in my former lecture.

Besides the above-mentioned possible consequences of ligature of the superficial femoral, we must not neglect to inquire into the influence of the operation upon the process of repair necessary to the restitution of the injured limb to health.

In the Paris revolution of 1830 Jobert tied the femoral artery (I presume the common femoral is meant), with a view to cut off the supply of blood from this region brought by the profunda, for hemorrhage in a case of gunshot fracture at the neck of the femur. Jobert remarks that the operation acted as a powerful antiphlogistic agent, and the resulting inflammation and suppuration were much less than generally follow these injuries. The patient recovered.

Granted that a given supply of arterial blood is necessary to health, and that to repair an injury more than the usual quantity is requisite, one would expect either that repair would be slower after ligature than without it, or that the disease would degenerate from the acute to the chronic, or perhaps even to the ulcerative or gangrenous. And I am inclined to think that, in the case which was the origin of my operation and these remarks, the wound which opened the joint, as well as a small incision made subsequently over the inner side of the knee to give exit to supposed pus present there, healed more slowly than they would have done had not the vascular supply of the limb been interfered with. If I am correct in this opinion, questions arising out of it are, At what age and state of the constitution, and at what stage of the disease, is this method of treatment admissible? At present I am rather of opinion that the age and state of health of a patient (with special reference to his heart and arteries) who would have the barest prospect of recovery from an uncontrolled suppurative inflammation of the knee-joint would weigh with me against the use of the ligature, and I should try compression, either digital or instrumental. In all probability the injury would be fatal under any circumstances.

The stage of the disease at which ligature of the main vessel (femoral, for example) would be contra-indicated would appear to be, judging from very limited experience, the suppurative, but of long standing. This observation is supported by the progress of Mr. Reeves's case. The good effect of the ligature was very transient—a circumstance probably due to the high vascular condition of the part consequent on prolonged inflammation in it. On the other hand, judging from equally limited experience in the child, profuse suppuration of a more recent date may be arrested by the ligature. In the upper extremity, in which arterial anastomosis is more free and repair more readily effected, the brachial artery might be ligatured, at a more advanced stage of suppuration, with every prospect of success. In Cases 12, 15, and 17, instances of inflamed hand associated with extensive suppuration and some sloughing, a favourable change occurred directly after the application of the ligature to *the brachial artery*. The *precise* moment and indication for

the application of the ligature in the lower extremity is when suppuration is only suspected to have occurred, or has only just set in.

When enumerating the risks inherent to the ligature, the possible ill performance of the operation—a segment or whole of the vein being included in the ligature—ought not to be omitted.

Time does not allow me to compare further the result of acute suppurative inflammation treated on the *ordinary* principles of surgery with the *extraordinary*, or ligature of the main artery. As I have said elsewhere, I believe the sudden obstruction of a main artery to be very much less dangerous than is generally supposed. We have been apt to draw our conclusions from instances of known diseased vessels, as in cases of aneurism. I was once present when a friend accidentally wounded the superficial femoral artery while opening an abscess in the thigh. We at once placed a ligature above and below the wound in the vessel, and no ill consequences whatever arose.

On Sept. 7th, 1867 (Case 10, Table of Arteries), I placed a double ligature upon the superficial femoral artery of a young man within an hour of its being wounded. He quickly recovered without the least sign of want of circulation in the foot. Again, in 1871 (Case 11), I ligatured the superficial femoral for a contused lacerated wound of the vessel. The man was of intemperate habits. Gangrene attacked the wound, and the man died ten days subsequently ; but there was never the least evidence of insufficient supply of arterial blood to the foot.

These cases suffice to show how rapidly the collateral circulation is established, and the part does not perish. Wardrop, also, says : " The enlargement of the anastomosing vessels to a certain extent takes place almost instantly after the trunk has been tied. I observed this in a child in whom I had secured the carotid artery. I could see the branches of the temporal and occipital underneath the delicate integument enlarging, and thus actively acquiring great additional vigour immediately after the operation."

There is thus accumulated a fair amount of experience to show that the principle of *withholding* blood from an inflamed structure, under certain conditions, is immediately beneficial. As to the means to this end, let them be as innocent as may be consistent with success. I would not for a moment insist on the application of a ligature in all cases where the principle is to be tried, provided that a simpler method will suffice, whether by compression with a tourniquet, by acupressure needle, or by hand. But it must not be forgotten that it is one thing to suggest a mode of treatment and another thing to carry it out efficiently. The ligature once applied, all anxiety as regards the passage of blood ceases; but less decided measures above-mentioned require such care and attention to details as can rarely be given. Having witnessed the value of the principle, I do not hesitate to urge upon the profession a trial of it when practicable. It may appear strange that I have not tied an artery oftener for inflammation; but I did not wish to ride my hobby to death, nor to bring the principle into discredit.

Facts and conclusions.—That ligature of the superficial femoral artery has arrested acute inflammation consequent on a wound of the knee-joint.

That ligature of a main artery will quickly diminish profuse suppuration, and prevent death by exhaustion.

That, while it arrests profuse suppuration, it will, by allowing the patient to gain strength, afford an opportunity for amputation at a future time.

That gangrene and secondary hemorrhage, as the result of ligature, should not be anticipated in the healthy subject.

That the dread of these has arisen from our knowledge of the consequences of the ligature in instances of known diseased vessels—aneurism for example.

That a slough on the heel, caused by the pressure of a splint, was quickly detached, and the wound soon closed, although the superficial femoral had been tied a few days previously.

That symptoms of inflamed bone ("starting pains") quickly disappeared.

That the arterial tension of the rest of the body will be increased beneficially by the ligature.—*Lancet, July* 3 *and* 10, 1875, *pp.* 1, 43.

43.—CLINICAL LECTURE ON A WOUND OF THE PALM.

By J. W. Hulke, Esq., Surgeon to the Middlesex Hospital, and to the Royal London Ophthalmic Hospital.

Perfect rest of the hand and forearm, enforced by fixing them upon a splint, in wounds of the palm attended with arterial hemorrhage, is the measure I desire particularly to impress on you. When you cannot reach the cut artery and tie or twist it, it is not enough to bind a graduated compress on the wound, and put the hand and forearm in a sling; nor will you have taken every precaution against a recurrence of the bleeding when, in addition to a well-adjusted compress, you have methodically bandaged the limb from the finger-tips upwards, a proceeding which may seldom be safely omitted; but you should also secure the hand and forearm upon a well-padded splint reaching beyond the fingers and above the elbow, and strictly forbid the slightest attempt on the patient's part to actively move the limb. If he wishes to shift its place he must lift it upon the splint with his other hand.

This may perhaps seem to some of you unnecessarily strict, considering the small size of the arteries in the hand and the usually trivial dimensions of these wounds. But, in truth, these palmar wounds are by no means unimportant,—they are amongst the most troublesome and anxious with which you will have to do, and they may never be treated negligently. Small as the vessels are, owing to the free anastomoses here they bleed very copiously—so abundantly, indeed, that exceptionally (as in old or otherwise feeble persons) even death may follow in a few minutes the infliction of the wound. Not many days since, the lifeless corpse of a man was brought to the hospital, who had shortly before gashed his hand with a broken bottle. His neighbours, whom he had left only a few minutes before, had found him seemingly lifeless on the ground in a pool of blood.

It is, I believe, to the neglect of adequate precautions during the first few days that these wounds so often take an unfavourable course,—that they slough and inflame, and bleed again and again, until at length the surgeon is compelled to tie the radial and ulnar or the brachial artery (at this stage always under unfavourable conditions), and the patient is fortunate if he escapes with his hand not over-crippled and permanently damaged. Some of you will not have forgotten a man in Broderipp ward last summer, who had wounded his palmar arch with a splinter of glass, and who, against the House-Surgeon's remonstrance, would not come into the hospital, but attended as an out-patient during several days; for he obstinately refused to believe that a little wound, which to him appeared only a mere prick, could be very serious. At length repeated losses of blood and great swelling of the hand forced him to become an in-patient. It had become necessary to tie the brachial artery in order to save his life, and he recovered with a permanently weakened hand and a stiff finger. Since this you have had the opportunity of watching a very parallel case under Mr. Clarke's care. Now, I think that the unfortunate consequences might have been avoided if the man had immediately entered the hospital, and submitted to the plan practised in the following case.

A stoker, aged twenty, on the night of December 14 last, was brought into the hospital in a swoon from the loss of blood. He had a few minutes before been stabbed through the hand with a large sailor's knife in a brawl. The blade had passed through the fourth interosseous space, making a cut three-quarters of an inch long in the palm, where it encroached on the carpus, and a rather short cut in the back of the hand. He very quickly lost so much blood as to faint, when the bleeding ceased spontaneously. The House-Surgeon adopted the customary measures in such cases; he bound a graduated compress firmly upon the wound in the palm, raised the hand and forearm on a pillow, and put the tape of a tourniquet loosely round the arm as a precaution in case of fresh bleeding. When I saw the patient at the mid-day visit I took off the tight compress from the palm, closed the gaping wound on the back of the hand with a couple of very fine stitches (as it was neither infiltrated *with extravasated blood* nor swollen), then bandaged each finger

separately and carried the rollers up the forearm and arm, placed a piece of lint dipped in carbolised oil upon the palmar wound (not stitching this, because its edges were somewhat infiltrated with blood), and upon this a small compress very lightly secured, laid the hand and forearm on a well-padded splint, supporting the palm with a ball of wool, and enjoined the strictest rest, forbidding the patient to lift the arm off the pillow except with the other hand. The pillow was so placed that the hand and forearm rested upon it nearly on the level of the shoulder as the man lay in bed.

Two things will probably have occurred to you: the tight compress was exchanged for a very light one; and the raised posture of the arm was replaced by one nearly horizontal. So long as a patient can move his hand, the efficient control of the bleeding can only be obtained with considerable pressure, and this the tissues so compressed cannot bear long without sloughing. When this happens, too often the wound bleeds afresh, and too often this is met by readjusting the compress still more tightly, to be productive of still more mischief. It is, therefore, very desirable to use only the minimum of pressure absolutely necessary. Greatly raising the hand in wounds or abscesses, which some do by slinging it from a gallows, is a practice I never follow, because I think any advantage due to the lessened force of the arterial circulation obtained by an approximately vertical direction is outweighed by the additional facility this posture gives to the downward diffusion of inflammatory matters from the hand into the forearm, leaving out of consideration the irksomeness of the posture. I believe that all the advantages obtainable by a tight compress and by a nearly vertical posture of the hand and forearm, without their accompanying disadvantages, may be gained by methodically bandaging the limb from the finger-tips upwards (as practised by a Dublin *confrère*), a light compress, and that strict rest which only a splint insures.—*Medical Times and Gazette*, *May* 1, 1875, *p.* 463.

44.—TWO CASES OF VARICOSE VEINS OF THE LOWER EXTREMITY TREATED BY EXCISION.

By N. Davies-Colley, Esq., Assistant Surgeon to Guy's Hospital.

Having observed with what safety the synovial cavities of joints and the sheaths of the tendons might be opened under Professor Lister's antiseptic treatment without fear of exciting suppuration or diffuse inflammation, I was induced last summer to apply this method to the radical cure of varicose veins in the lower extremity. From the success which attended the experiment, I think the operation bids fair to supersede all other plans of operative treatment, which have hitherto been employed in this troublesome complaint. The following are the only cases in which I have as yet applied the method.

George G., æt. 34, was admitted into Job ward, July 29th, 1874, under the care of Mr. Davies-Colley. He is employed at some whitening works in Bermondsey, and has a great deal of standing. About two and a half years ago he began to suffer from swelling of the veins on both legs, which has gradually increased up to the present time. He has had them bandaged, but without much relief, and has been obliged to leave off work on account of the pain which they have caused him.

On admission.—The veins of both legs are considerably enlarged, but his chief trouble is a varix on the inner side of the right thigh, a short distance above the knee. This forms an elevation 4½ inches long, by 2½ inches broad, ¾ inch above the level of the surrounding skin. It has a lobulated appearance, as if it were formed by the convolutions of a vein as thick as the little finger. From its position it seems to be a part of the internal saphenous vein.

August 3rd. Chloroform having been administered and the blood removed from the limb by the application of Esmarch's elastic bandage and tourniquet, Mr. Davies-Colley made a longitudinal incision 5 inches in length over the varix. He then dissected out the whole of the convoluted mass which

turned out to be a single irregularly dilated vein, more than a foot in length, when extended. A catgut ligature was applied to the vein at the upper and lower parts of the swelling and the whole of the intermediate portion was removed. No sutures were used to draw the edges of the wound together. A spray of carbolic acid diluted with 40 parts of water was employed during the whole of the operation, and the wound was dressed with carbolic gauze dipped in a mixture of 1 part of carbolic acid to 40 of olive oil. The elastic band, which had been used as a tourniquet, was taken off before applying the dressing, and a small amount of venous hemorrhage occurred which was readily controlled by pressure.

During the operation it was found that the varix lay upon the internal saphenous vein, which was not much if at all larger than normal. As there was no apparent connection between the diseased vein and the saphena, the latter was not interfered with.

No febrile symptoms followed. A considerable blood clot undermined and separated the edges of the wound for some days after the operation. Some suppuration then occurred, and shreds of fibrous tissue with portions of softening clot were discharged for three or four weeks. There was, however, no extension of inflammation to surrounding parts nor any sloughing of the skin, and the ulcer which was left healed rapidly. On September 14th, he was allowed to get up, and on the 18th he went out.

On February 2nd, 1875, I learned that he returned to his old employment two or three weeks after he had left the hospital, and that he had been able to work regularly at an occupation which necessitated continual standing. He had had no further trouble from swelling of the veins, although he had worn no bandage to support them. There was no pain in the legs, and he felt better than he had been for several years before.

Lydia A., æt. 22. Admitted into Dorcas Ward, under Mr. Davies-Colley, August 12th, 1874.

Patient has been married three years, and has had one child, who is now two years old. Before her confinement she noticed a swelling in her leg, but suffered no pain. This enlargement of the vein has continued up to the present time. A short time ago she undertook the nursing of a fellow-lodger who was ill. The unusual strain put upon her leg from walking about and standing caused it to become very painful. She came as an out-patient for about five weeks, and was then admitted into the hospital.

On admission.—Patient looks in good health and strong. On the inner side of her left popliteal space at the back of the inner tuberosity of the tibia, there is a swelling 2 inches long by 1½ inches broad, and elevated ½ inch. It is continuous below with an enlarged vein which commences near the internal malleolus. No other veins are enlarged.

14th. Chloroform having been administered, Mr. Davies-Colley made an incision about two inches long through the thin skin over the swelling on the inner side of the popliteal space. He then dissected out the vein at the lower part of the varix, and having carefully isolated it placed a thin catgut ligature round it, and divided it above the ligature. The cut end was then held with a dissecting forceps, and the swollen vein above readily separated by gentle traction and a few touches of the knife from the surrounding structures. A fine piece of catgut was tied round its upper extremity, and the intermediate portion removed.

There was little hemorrhage, although no means were taken to arrest the flow of blood through the veins. The carbolic spray was used during the operation. Catgut sutures were inserted and the wound dressed with carbolic gauze. A short back splint was applied to the knee.

The wound was dressed in the same antiseptic manner on the 16th, 17th, and 19th. No discharge except of bloody serum was observed, and the whole healed up by primary union. The patient went out on the 9th of September.

On February 2nd, 1875, I examined the limb and found that there was still a slightly enlarged vein from the inner ankle up to the cicatrix left by the operation. The patient however suffered no inconvenience from it, and was able *to walk about quite comfortably.*

These two cases are examples of the successful application of a very old operation. In Celsus de Medicina, lib. vii., chap. 31, the excision of large varices is recommended, and a similar method to that adopted with these two patients is described. The same plan has also been employed by many British surgeons, but it fell into disuse on account of the diffuse inflammation and pyæmia, which have occasionally followed its application.

By the careful employment of antiseptic measures during the operation, and in the subsèquent dressing, I believe that these dangers may be averted.

The practice of ligaturing the veins over pins, and then subcutaneously dividing them, is not altogether exempt from danger, and it is in some respects decidedly inferior to the one above described. There is always considerable uncertainty as to when the pins can be safely removed, and the subcutaneous section of the vein is occasionally inadequate to produce its obliteration, whereas, after excision, the destruction of that part of the vessel is complete, and the patient is spared the inconvenience of having the pins in his skin, and the pain of their removal. If I had applied the ordinary method in the first of the cases I have described, there would have been serious danger of transfixing the internal saphenous vein, as I had thought that the varix was formed by that vessel, and should therefore have been at no pains to avoid injuring it. We are often deterred from operating on varices by the fear that, if we remove them, other veins will enlarge to carry on the circulation instead, so that the condition of the patient will soon be no better than it was before. If, however, the varices are produced, as in this case, by the enlargement of superficial veins, while the great trunks are free from disease, I think we may regard the affection as local, and need not fear the compensatory enlargement of the neighbouring veins, as the removal of the varices will not materially interfere with the return of the blood from the limb. In operating again by this method I shall endeavour to avoid taking away so large a piece of the vein as in the first case, for the recovery was delayed by the wound having to heal by granulation. In the second case the wound was small, and united by primary union—a result which it is probable that we may generally count upon if we take care to cut away only a small portion of the vein, and to disturb the tissues as little as possible.—*Guy's Hospital Reports*, 1875, *p.* 431.

45.—ON NÆVUS.

By Dr. George Buchanan, M.A., Professor of Clinical Surgery in the University of Glasgow.

Nævus which is an example of one of the varieties of aneurism by anastomosis, exists principally in the integument, but it may occur in the subcutaneous tissue; hence we have cutaneous and subcutaneous nævi. In a large number of instances, these two kinds of nævus are combined in the same example, but, when we have two distinct specimens, the one cutaneous, the other subcutaneous, the characteristics are a little different. Cutaneous nævus exists as a red patch—a red spot upon the skin—and, as it very often is found immediately after birth or at birth, it is popularly called mother's mark. In the form of a red spot upon the skin, it may have no tendency to spread; it may remain a permanent patch of the size it was when the child was born, or it may tend to spread over the surface of the skin, as we see in the example before us. Subcutaneous nævus exists as a tumour, swelling, or protrusion of the integument. It produces a bluish tinge of the surface, and is soft, puffy, elastic, capable of being compressed and reduced in size by the emptying of the vessels, but returning to its original size when the pressure is taken away. This subcutaneous nævus exists in the tissue between the skin and the adjacent structures; in other words, underneath the cutis in the adipose tissue; and it is soft, yielding, and elastic, and the tumour may rise to a considerable extent. Now, in the case before us, you have *a very well marked specimen* of the two kinds; nævus maternus proper, or

patch upon the skin, combined with the subcutaneous projection or tumour caused by disease of the vessels of the subcutaneous tissues.

Let us for a moment or two attend to the first kind; the nævus maternus, or mother's mark. Very little explanation is necessary for it. It is simply an exaggeration of the capillary circulation; hence it is called capillary nævus. When circumscribed, as it very often is, within the circumference of the patch, the size of the capillary vessels is increased, and the consequence is that, instead of being pale pink, it becomes red in colour, slightly turgid, from the increased quantity of blood-corpuscles. It may, therefore, be described as a condition of the skin in which the capillary circulation is enormously exaggerated, and consequently the part becomes more swollen. Most commonly, it is congenital; but sometimes, as in the case we have just seen, it begins a few weeks after birth, and, when it begins after birth, its tendency to spread is greater than when the child is born with it.

If, therefore, you are called to see a child born with a nævus of a small size, and if you notice that within the next few weeks there is no tendency to enlarge, you are not to be in any great hurry to deal with that spot. But, if the spot enlarge rapidly after birth, or if it make its appearance some time after birth and begin to enlarge, then is the time to attack the nævus maternus, if you wish to do it in any effectual way. A minute spot of nævus maternus, which is a very important thing, especially in the case of females, when it attacks, as it usually does, the head or face, can very often be satisfactorily treated at an early stage. There are a great number of ways of treating it.

If it be very small, a very useful way is by vaccination; by putting the vaccine vesicle upon it. The vaccine vesicle runs its course and results in a cicatrix, which involves the whole tissue of the nævus maternus. The effect is, that what was a red mark becomes a pale cicatrix. If it be not larger than a finger-nail, then by applying a number of points of vaccine lymph round the circumference and perhaps one or two in the centre, you include a large portion of it in the vaccine disease, and it frequently has the effect of obliterating the spot. Then the vaccine vesicle equally protects the child from small-pox, as if it were applied in other parts of the body, consequently you are, so to speak, killing two dogs with one stone. You will often fail, however. Conversing with general practitioners who undertake the treatment of this condition in the child, you will find almost every one of them say that, though they succeed in one or two cases by the adoption of this method, there are a great number of failures. And, in my own experience, I have been called on frequently to deal with cases of nævus which have been unsuccessfully vaccinated at an early stage; but I only bring this forward in order to prevent you being discouraged when you are unsuccessful with this mode of treatment. In a considerable proportion of cases, vaccination will serve the purpose of curing the disease; in others, it must be treated in another mode.

Another way of treating nævus, when of small size, is by introducing red-hot needles. The needle of the galvanic cautery will coagulate the blood, produce inflammation, and cause the destruction of the tumour and the obliteration of the spot. The point of a needle dipped in nitric acid, or in a concentrated solution of perchloride of iron, sometimes has the effect, all of these aiming at the same thing: coagulation of the blood in the skin or nævus.

These are examples of methods of treatment of the simple form of nævus maternus; but, when it comes to be a case of the other kind, which is the case that is most frequently dealt with in hospital, such a method of treatment is altogether unsuitable. Subcutaneous nævus or nævoid tumour, to which I refer, consists of a dilatation of the vessels of the venous side of the tumour; hence it is often called venous nævus. To understand my observations, recollect that a tumour of the nature of aneurism by anastomosis is found of two varieties, according as the venous side of the circulation or the arterial side is affected. I am disappointed in being unable to show you a patient whose presence I expected, a good example of the arterial variety of the tumour; but I may state that, when a subcutaneous tumour results from dilatation or enlargement *of the arterial side of the* circulation, it is called cirsoid aneu-

rism. In that case, the tumour is semi-solid, pulsating, and presents many of the characteristics of aneurism. It most naturally occurs somewhere on the forehead or on the scalp in the inosculation between the temporal and occipital arteries. In the instance referred to, the tumour consisted of dilated arteries, which, under the finger, felt serpentine, being compressible and soft, evidently from being thin in their coats. They have somewhat the character of veins, except that they are pulsating; hence the tumour into which they enter being full of tortuous dilated vessels like varicose veins is called cirsoid.

I shall devote the rest of the time to the consideration of the nature of venous subcutaneous nævus. This exists in the form of tumour, elastic, compressible; and, when we take the fingers and compress it, we can diminish its size by the force which we apply to it. When a tumour of this kind can be removed from the body, it is found in its interior structure to have a close resemblance to the corpus cavernosum or corpus spongiosum penis. It consists of two tissues,—a quantity of fibrous tissue, which forms, as it were, the envelop of the tumour and the blood-vessels contained in the interior. On a section of the tumour being made (such as I now make of the one removed three weeks ago), it is found to consist of a number of threads of fibrous tissue dividing the interior into a large number of spaces, which are not separate exactly one from another, but communicate with each other. Among these threads or trabeculæ there pass a number of vessels connected with the arteries which enter the tumour on one side and the veins which leave the tumour on the opposite; and the vascular tissue in the interior is not composed of capillaries, but capillaries which have become enormously dilated, and in which gradually the walls of the dilatations have come to be adherent; and one very often finds that perforations have occurred between one of these dilated capillaries and the other; so that instead of the blood passing from a series of vessels, it passes through a series of blood-spaces, which have resulted from the destruction of the walls of these dilated capillaries. Hence any injury to such a tumour containing blood lying in these blood-spaces must be a dangerous thing and greatly to be feared.

Now, this nævus may occur in almost any part of the body; but I need scarcely say that the parts where it most naturally occurs are the most vascular; those parts where the communications between the vessels are most frequent; namely, the scalp, brow, and face, and generally the front part of the body, but not exclusively, for I have seen nævi upon the back, upon the thigh, and upon the buttock, and almost upon any part of the body you could name; but the vast majority of nævi occur upon the face and head, and consequently in places where the deformity is very great indeed. The tendency of these nævi frequently is to spread and involve more of the adjoining tissue. In the example we have before us, the spot made its appearance at the side of the eye, and gradually has extended to the other side of the face and down upon the neck as far as the breast. Such cases frequently occur; but there are others that extend and grow outwards, and are more dangerous, though not having so great a circumference.

With regard to the treatment of subcutaneous nævus, various methods may be adopted. It is to be remembered that in them the circulation is sluggish, as you would naturally suppose from the description I have given you of the condition of the vessels; but, when the tumour is injured, dangerous hemorrhage may ensue, and hence various plans have been proposed and put in execution for their removal, most of which I shall mention. The first plan has for its object to coagulate the blood in the tumour, and in consequence produce contraction and obliteration. There are many modes by which the blood existing in the tumour may be coagulated, the result of which would be consolidation and contraction of the tumour, and gradual absorption of the condensed tissues produced. One of the most common modes is by inflammation produced in the tumour by the introduction of a seton. The needle is threaded with cotton thread. The thread may be dipped in some acrid substance, and the tumour may be transfixed in several places and the string left in the interior. As I mentioned to you, the circulation is not *very active, and it is* some encouragement to you that the hemorrhage in

such an operation is rarely worthy of notice. The thread left in the tumour produces a certain amount of inflammation, and that inflammation coagulation round the thread; and, if two or three threads are passed through, there will be two or three lines of coagulation, and so it spreads till the whole tumour is consolidated. If you do not succeed in the first instance, another series of threads may be passed through, and, in the end, the tumour will be consolidated. That method only applies to tumours of a comparatively limited extent. Another plan of dealing with nævus is by the application of caustic substances, especially when it is a combination of the two kinds of the disease, and when the tumour is of comparatively small size, and is upon the edge of the lip, the tip of the nose, the brow, or the cheek. The application of strong nitric acid on a piece of wood held against the spot for a considerable time has the effect of producing an eschar or slough. That slough may separate with a certain amount of inflammation; that inflammation coagulates the blood, and gradually obliterates the tumour as before. The third plan is to produce coagulation in the interior by the introduction of the galvanic cautery, or a red-hot iron, if you like—the actual cautery. But the galvanic cautery is best, because it gives you a continually red-hot needle. It produces coagulation in the neighbourhood of the needle; the coagulation extends till the tumour is consolidated and obliteration takes place. Another plan is to introduce, by means of a very fine syringe and hollow needle, a drop or two of perchloride of iron. Perchloride of iron is, of all salts of which we are aware, the one which most rapidly coagulates the blood; hence, when we have hemorrhage from a wound in which we cannot get the blood-vessels tied, we take a small bit of perchloride of iron, or take a piece of lint and dip it in a solution of perchloride of iron, and it will coagulate the blood at once. A few drops of this fluid introduced in subcutaneous nævus will coagulate the blood, and produce consolidation and obliteration as before. Take care, however, that you never employ this form of treatment of nævus in the neighbourhood of a large vein, such as a nævus situated at the lower part of the neck, which is a rare thing, or a nævus near the circumference of the orbit, because a portion of the blood coagulated by the introduction of this fluid may become detached, and may form what is called embolus, or a floating clot, and may get into the circulation of the blood and float away nobody knows where; and may continue floating on until it produces a plug, which may interrupt the circulation in the vessels and produce serious consequences. I knew a case in which a few drops of perchloride of iron were introduced into a subcutaneous nævus on the eyelid of a young child. I was not present, but the description of the result was to me appalling. The child was brought alive, and looking well on its mother's knee. A drop of perchloride of iron was introduced, and in two minutes it was dead, just as if shot through the head with a pistol. A particle or portion of the coagulated blood had entered into the ophthalmic vein, and had gone back and got plugged in some part of the venous circulation at the base of the brain, or orbit. Congestion or stagnation of the blood had taken place, and the result was fatal. Such are the principal plans that may be adopted to produce consolidation.

When the tumour is too large, or when it has resisted all these plans—and you will frequently find examples where these plans are not capable of being performed, or, where having been tried, they have proved ineffectual—there are other two methods by which a tumour may be removed. There is, first, by ligature. Ligature is applicable to nævus when it is circumscribed; when you can, without difficulty, pass a needle under the base of the tumour. The needle is armed with a piece of string, then the string is passed beyond the edge of the tumour, brought underneath its base, and made to emerge beyond its base on the opposite side. The tumour is again transfixed at right angles to the former direction, and a double ligature is brought through underneath the tumour. We have thus two ligatures passing underneath the tumour in one direction, and two passing through in the opposite direction. Next, the ligatures are tied together, and then the whole is constricted and tied together by the free ends. Thus the whole of the base of the tumour is *circumscribed, and strangulation* takes place by the string passing round the

base of the tumour. If the surgeon be not satisfied with the result of the strangulation, he can put another ligature round the base on the outside. If the skin be affected, the tumour is transfixed without any previous operation; but, if it be subcutaneous, and the skin comparatively unaffected, it may be saved by dissecting back four flaps, and the tumour may be transfixed as before. That, up till very recent times, has been the general plan of treatment, and it is often effective; but it always involves a certain amount of doubt as to the surgeon having got to the bottom of the tumour, and it also involves a long and troublesome process of sloughing and separation; consequently, of late years, we have begun to adopt—and I have seen very few cases in which it cannot be adopted—the method of excision; and it seems to me that we are coming to use this method of dealing with vascular tumours a great deal more freely than formerly. When I was a student, I used to be much afraid of a great number of things we do now with the utmost confidence. When I was a student, nobody would have ventured to have put a ligature on a vein, for fear of the vein becoming inflamed. Nowadays, we never allow a patient to leave the operating-table after amputation when any tendency to bleeding exists, without securing the veins, so that hemorrhage may be completely arrested. Nævus was for a long time treated by ligature or consolidation, in consequence of the fear entertained of adopting incision upon these tumours; but I need not do more than refer you to the case brought before you the other day, in which I performed an operation, which I told you at the time looked almost appalling, but which, in consequence of the arrangement of which I am going to speak, was performed with comparatively little difficulty and very little hemorrhage. These nævi, when circumscribed, are more or less incapsulated. This capsule consists of the very tissue which permeates throughout the interior. While there is no well-defined capsule in which it lies during the progress of its growth, the tissue gradually becomes so condensed, that it forms itself into a capsule; hence, if you adopt the plan suggested by John Bell, which is the principle that must guide us in dealing with these tumours—namely, never to cut into it, but to cut it out—you can deal with almost any tumour. Apply the knife in such a way as to cut the tissue exterior to the tumour, and by your incision take out the tumour entire. Do not spare it; do not leave a single bit of it; cut on the exterior of it, and lift it out with its capsule, as you saw this one, which was removed about a week ago from the child I am going to show you, and you will be perfectly certain that you have got beyond the tumour, with no danger of bleeding. You thus remove the whole of the tumour, and the only thing you have got to do is to deal with the vessels entering into it from the outside; and the number of vessels entering into one of these tumours is not so great as you would expect; consequently, when you saw the tumour removed the other day, we had only to deal with the mouth of the facial vein and that of the facial artery and one or two small ones that exist in any child's face. As in the operation by ligature, it is of vast importance, for the sake of the appearance of the child afterwards, to save the skin. For this purpose, you must make the incision upon the surface of the tumour in such a way as to enable you to dissect off any portion of the unaffected skin. If the surface of the skin be entirely healthy—I mean if the integument over the subcutaneous tumour be altogether healthy—you may apply your cuts in such a way as is most suitable to the situation; but, in the case I had to deal with, and the result of which I shall show you, a portion of the skin was affected as well as the subcutaneous tissue. You must have been surprised to see the irregularity of the incision made over the surface of the tumour to save the pieces of the sound skin. And, when the operation was completed and the parts readjusted, it was matter of surprise to myself how the pieces of skin dissected back served the purpose of covering the wound upon the child's face after the enormous excision was made. When you save as much of the unaffected skin as possible, leave it comparatively loose, and, after granulation of the surface, the skin will gradually flap back into its place and unite in a way that will be perfectly surprising.

(*Child brought in.*) This child had an enormous nævus, extending from *the edge of the eyelid* down to the angle of the mouth, and protruding to a

great extent. In the centre of the tumour, there was a cutaneous nævus about the size of a crown; and, at the inside next the nose, there was another cutaneous nævus about the size of a shilling. An incision was made, as you saw, in such a way as to save the skin covering the eyelid, and another so as to save the lower half of it. These flaps were turned back and the whole cheek was exposed. This tumour (on the table) with the enclosed nævi, now blanched by being preserved in spirit, was cut out of the cheek, leaving those small flaps on the face. This was done three weeks ago, and we now find that, although there is a considerable amount of œdema, there is sufficient skin left to cover the surface. Within three weeks of an operation, of course it is impossible to speak as to the ultimate result ; but, in the meantime, the child has recovered from the effects of the operation in a way that is very gratifying.

The whole front of the face between the eye and the mouth, which was exposed, is now healing up; cicatrisation has taken place at a certain point, and is rapidly proceeding at others. In the meantime, it appears to you swollen. That depends upon the œdema upon the eyelid, near the nose, which will very much diminish. I believe that the child will recover, and that the tumour will altogether disappear, with an amount of disfigurement in the face exceptionally small.

The operation must have appeared to you a very painful proceeding, and it was one which I undertook with a very great deal of anxiety, in consequence of the great extent of the incision to be made, and the amount of tissue to be removed; yet I did it with very great confidence, in consequence of an operation which I performed two or three years ago. I expected to have had the child here, but I have been disappointed, its parents having left the city for Fife. That tumour was greatly larger than the one now before you, and it was much more troublesome, as it involved not only the skin and the subcutaneous tissues, but the mucous membrane of the mouth. It extended from the angle of the eye down to the nostril and into the mouth; in fact, involving the whole of one side of the cheek, from the integument into the mucous membrane, and presenting a case almost intractable. The child was in great danger ; otherwise it was a healthy child, and, on account of the disfigurement, it was impossible to deal with the case in any other way. I performed the operation accordingly, and removed the whole of the cheek by introducing the *écraseur* at the superior angle, and by putting pins through the cheek beyond the limits of the tumour on both sides, the whole cheek involving the affected tissue was removed by a sort of A-shaped section made by the *écraseur*, which I used instead of the knife, on account of the amount of hemorrhage which I feared would take place. When the operation was completed, the gap was something frightful to look at; but, with a little stretching, we succeeded in bringing the two sides together. The operation being performed by the *écraseur*, it produced a rough edge rather than a clear incision. But the patient being a growing child, in which the circulation is active, adhesion took place, and it was dismissed from the infirmary when the edges of the wound united, although I must say its appearance was far from attractive. Last year, I had occasion to perform an operation upon a man in one of the suburbs of Glasgow, and, after it was completed, a person in the house said, "Do you know that child?" (pointing to a child about four years of age). I said, "No." I was then asked to look at it a little better. I did so, and said, "Some operation has been performed upon it; has it had a bad hare-lip?" The mother said, "No; that is the child from which you cut the tumour two years ago." From the growth of the child, the parts had become adapted to one another, and, every trace of the nævus being removed, the parts had accommodated themselves in such a way, that the deformity was almost entirely removed. There was little more mark upon the child's face than results from an extreme form of hare-lip. As this child you have just seen is only nine months old, if it recover, as it likely will, and be spared for two or three years, the probability is that, if you saw it again, you would find that the parts were nearly restored, and you would hardly be able to recognise it as the child on whom the fearful operation was performed.—*British Medical Journal*, *June* 26, 1875, p. 831.

46.—ON SCARLESS ERADICATION OF NÆVI.

By Richard Barwell, Esq., Surgeon to Charing Cross Hospital.

It need scarcely, at the present day, be pointed out that nævus maternus should not be made the subject of operation unless some circumstance renders interference necessary. Such circumstance may be rapid growth, inducing danger by hemorrhage; and such danger may be increased by position, as, for instance, at the mastoid process, where a nævus may, by growth in size and complexity, become a cirsoid aneurism or aneurism by anastomosis. Position may, however, of itself be sufficient to call for operative measures, since, for instance, a female child of the upper walks of life, with a disfiguring nævus about the face, neck, or arms, should hardly be left thus marked; and here also it is of great importance to choose such operation as shall leave no scar behind—hence such as shall destroy no skin, not even that discoloured by the growth to be eradicated.

The mixed nævus therefore requires, if no scar is to be left, two forms of treatment, which may be carried on simultaneously—one for the skin portion and another for the subcutaneous. Subcutaneous strangulation of a nævus, effected by passing a string round the base of the tumour and tying it as tightly as possible, is a painful process replete with danger; it frequently fails in its purpose, as the tumour sloughs, and the slough either involves the skin and comes out by it, or it does not implicate the skin, and the dead morsel becomes a source of great danger. These inconveniences are due partly to the material used, but chiefly to the rapid and complete strangulation, as it were, by a blow. A mixture of slow strangulation and of cutting avoids these contingencies, as I have tested by many cases and several years' experience.

The operation may be thus performed:—Having carefully made out the limits of the nævus both as to depth and circumference, a needle armed with not too fine a wire is passed through the skin, half round the tumour, and out again opposite the place of entrance; the nendle is then introduced at the same puncture by which it had just emerged, and, passing round the other side of the tumour, makes its final exit at the opening first made. In certain cases, large size or peculiar shape of the tumour may render it necessary to bring out the needle twice instead of only once. However that may be, the effect is to enclose the base of the tumour in a wire loop, both ends of which, emerging at the same opening, are under perfect control. These might merely be twisted together till the requisite tightness is attained, but in this practice certain inconveniences arise which I have obviated by another expedient. A vulcanite oval plate, about three-quarters of an inch long and an eighth of an inch thick, has two holes bored obliquely through its thickness; and on its external surface two little studs project close to where these holes emerge, and where also they are furthest apart. By bringing the end which passes by the right side of the nævus through the left hole, and *vice versa*, the wire is made to cross, while the oblique direction of the holes permits it to run smoothly. The surgeon, having thus arranged his appliance, draws upon the wires until the nævus is rather tense, and then twists each end round the nearest stud. A piece of lint, slit so as to bestride the wire, is introduced between the skin and the vulcanite button, and prevents any undue pressure by the edges of the plate.

On the third or fourth day the wire will have become somewhat loosened: one of the ends is to be untwisted from the stud, drawn tight, and again secured. This process is to be repeated until the wire comes away, when, as must be evident, it has not merely strangulated, but has cut through the base of the nævus with all its vessels of supply; in fact, it has acted like a slow and sure écraseur. During this procedure some pus forms and escapes by the needle punctures, but the treatment is so painless that, except at the time when the wire is being tightened, the child suffers no pain, is not fractious, and remains quite well.

Thus the subcutaneous part of the nævus will be destroyed, and in many *cases the cutaneous* parts will at once begin to shrivel and to lose their morbid

colour. In other cases this change is either very slow or will not take place without some aid. The best means of effecting this is to brush the coloured parts with strong nitric acid, leave it for a few seconds, and then to wash it off with an alkaline solution. Care must be taken not to leave on the acid long enough to destroy the skin or to produce ulceration. This had best be done while the wire is still encircling the base of the nævus.—*Lancet, May* 8, 1875, *p.* 642.

47.—ON THE TREATMENT OF CERTAIN FORMS OF VASCULAR ERECTILE TUMOURS BY GALVANO-PUNCTURE.

By Professor JAMES SPENCE, F.R.S.E., Surgeon to the Royal Infirmary, Edinburgh.

To the uses of galvano-puncture or electrolysis in certain forms of vascular erectile tumours I wish more especially to direct your attention as a most valuable addition to our means of treating these often formidable growths. I do not speak of it as a general method, you will observe; for there are many forms of nævi and erectile tumours—in truth, a majority of that class of diseases—in which other methods are more rapidly effective.

Galvano-puncture is specially indicated in those cases in which the erectile tumour is deep-seated and covered by healthy, undiscoloured skin. Until a few years ago, our interference in such cases was limited to dissecting off and reflecting the superimposed textures, so as to expose the tumour without touching it with the knife, and then strangulating it by strong ligatures, and, when the growth had sloughed and separated, replacing the flaps of skin; or by ligature of large arterial trunks indirectly connected with the growth, as, for example, ligature of the carotid artery for orbital erectile growths. The former method was attended with grave inconveniences and dangers; and the latter, besides entailing risk, was most uncertain in its effects, as you can readily understand from the nature of the disease. More recently, injections with the perchloride of iron took the place of these methods, and, in a great number of cases, answered very well, but in others a very considerable amount of sloughing took place before the rest of the tumour had been consolidated, and in such cases severe hemorrhage occurred, and the life of the patient was endangered. In some cases also the injections of perchloride were attended with a rapidly fatal issue, apparently from thrombosis. I must, however, say that I never saw such a result, though I have long used, and continue to use, the perchloride of iron injections, and I can only attribute such accidents to the neglect of tearing up the texture of the tumour before injecting the perchloride.

Contrast of the results of different methods is perhaps the most effectual way of impressing their comparative advantages, and shows what advance our science is making; let me, therefore, bring under your notice the following cases from my own practice. An infant, six weeks old, was sent to my care on account of a deep-seated pulsating erectile tumour, occupying the palm of the hand, and extending up to the wrist. The tumour had been growing rapidly, and at one point the skin was thin and discoloured. I used injection of perchloride of iron, and part consolidated. Again it was used, and the consolidation was followed by inflammation and the separation of a small central slough. From the ulcerated surface, bleeding took place, and though arrested by local application of the perchloride, it returned from time to time, and as the child's life was thus endangered, and the growth seemed rather to increase than diminish, I was forced to amputate in the fore-arm, when the infant was eight weeks old. She made a very rapid recovery, but with the loss of a hand. I show you here the cast of the hand of an infant affected with deep-seated pulsating erectile tumour very similar to the former. In this case I applied electrolysis during three months while the child was under my care in *hospital*, and by several applications of the battery the *growth began to consolidate* and contract, whilst, except at the time of an

application, the child suffered no irritation. As it was inconvenient for the mother to remain in hospital, I asked Dr. Connel, of Peebles, who had sent the case to me, to conduct the remainder of the treatment. As the child's parents lived at some distance from Peebles, the applications of electrolysis could only be made at long and irregular intervals. Here is a cast of the hand when the cure was completed; and, when you contrast it with this preparation of the amputated hand of my former case, you will, I think, agree with me that the result is a triumphant vindication of the value of electrolysis in such cases. I have used it also in other cases with advantage, especially in an enormous erectile nævus of the face of a girl. It is of importance that it should not be applied indiscriminately to all cases of nævus or erectile tumours. I think its use should be restricted to cases where the erectile growth is covered to some depth by healthy skin. The needles are coated to a certain length with a non-conducting material, which protects the healthy superimposed texture, whilst the uncovered points passed into the growth act on it at different parts. If needles be applied to a superficial erectile spot, they cauterise and leave more mark than other methods, such as application of nitric acid, perchloride of iron, or iodine. Thus, in treating the large erectile nævus of the face, the electrolysis was only used to the deep-seated portions, while the superficial discoloured marks were treated by applications of perchloride, iodine, &c.—*Medical Times and Gazette, Aug.* 21, 1875, *p.* 209.

48.—HEALING OF WOUNDS BY BLOOD-TISSUE.

By JOHN CHIENE, Esq., Assistant-Surgeon, Edinburgh Royal Infirmary.

"The blood being alive, this uniting medium becomes immediately a part of ourselves, and the parts not being offended by it, no irritation is produced."—(JOHN HUNTER, chapter on Union by the First Intention.)

The organisation of an accidental blood-clot in open antiseptic wounds in Mr. Lister's practice and in cases under my own care, first suggested to my mind the propriety of trying to heal a recent open wound by filling, at the time of the operation, the cavity with blood, which would coagulate, become organised, and which in time would become covered with epithelium. The expectation was that less contraction would follow if the wound healed by blood-tissue than if it was allowed to granulate and heal by cicatrisation.

A young man suffering from a horn on the point of the heel was admitted into the surgical clinical wards in the Edinburgh Royal Infirmary in April last. The case appeared a suitable one for the experiment, because the situation and nature of the wound which would require to be made in order to remove the horny projection was such that union by the first intention was unattainable, and if the wound was allowed to granulate and heal by cicatrisation and contraction, like an ulcer, the result would be drawing up of the heel and deformity and lameness in walking. The horn had been removed twice previously, but had again grown. At one of these operations the healing of the wound was assisted by the organisation of an accidental blood-clot. The horn now projected from the surface to the extent of the third of an inch, consisting of layers of horny epithelium, and had a circular base nearly the size of a shilling.

On the 18th of April, 1875, a tourniquet was applied, and the horn removed; the resulting wound was triangular in shape, each side of the triangle being an inch and a quarter in length. The soft tissues down to the bone were removed, and the surface of the os calcis scraped with a periosteum scraper. The cavity was half an inch in depth. No vessels were tied. A piece of protective was placed over the opening in order to close it, and the usual antiseptic dressing applied. The tourniquet was then removed. The *expectation was that* blood pouring from the sides and floor would fill the *cavity. The operation* was performed under a spray of carbolic acid. On the *following day the* wound was dressed, and it was found that with the excep

shallow depression at one corner, the entire cavity was filled with
t. This was not disturbed, and the dressing carefully reapplied.
ixth day the clot was of jelly-like consistence, and still of a dark
. On the twelfth day the clot was of firmer consistence, and of a dark
olour. The clot did not bleed when scratched. On the sixteenth
superficial portion of the clot, which corresponded to the depth of
kened horny epithelium of the heel, liquefied, and came away in the
ss. The surface of the clot was now on a level with the deepest
horny epithelium. It bled when scratched at its centre, and the
blood filled a slight groove on the surface of the original clot. On
nty-sixth day the original clot was distinctly vascular, and on its sur-
e secondary clot (the result of the scratching of the original clot on
enth day) was observed of a dark colour, and adherent to the origi-
. This secondary clot passed through the same changes as the origi-
; the changes were, however, more rapid, in consequence, I presume,
naller size. On the thirtieth day the sharp-defined edges of the origi-
nd in the horny epithelium had disappeared, and an epidermic forma-
s observed on the surface of the clot at its edges. On the thirty-
lay the wound was healed, the blood-clot being entirely covered with
um. The triangular wound was still distinctly marked, and no contrac-
d taken place. No attempt was made by bandaging or splints to pre-
ntraction during the cure.

patient was shown at the June meeting of the Medico-Chirurgical So-
this city. It has yet to be seen whether contraction will take place.
actical value of this method of healing wounds by blood-tissue has yet
ested by further experiment. The case is, however, worthy of record:
ecause, as far as I am aware, it is the first in which a systematic at-
has been made to utilise blood as a tissue for the filling up of an open
. At present it seems to verify the quotation from John Hunter with
this short paper is headed. Secondly, because it is a practical lesson,
g the slight amount of irritation in wounds treated antiseptically ; it
ible picture of the unseen changes which take place in a subcutaneous
clot as in a simple fracture.—*Lancet, July* 10, 1875, *p.* 47.

ALIMENTARY CANAL.

ON A SLIGHT MODIFICATION IN THE OPERATION FOR CLOSING FISSURES OF THE SOFT PALATE.

By Edward Bellamy, Esq., Senior Assistant-Surgeon to Charing Cross Hospital.

ose who are in the habit of operating upon these cases, are aware how
tant is the passing of the first suture, and that its disposition with re-
to the edges of the cleft and to the limit of the extent of the fissures,
f the first moment to the subsequent steps. Now it very frequently
ns that the processes of freshening the edges of the cleft, and of divid-
e muscles, in the hands of inexperienced operators, render the subse-
passing of these sutures a matter of considerable difficulty, even al-
h the patient be chloroformed, and the parts distended by means of the

ave found that the primary introduction of a silver wire suture in the
ring manner is a great auxiliary to success in the more important steps of
peration, before the edges be freshened, and the myotomy performed.
dle armed with stoutish silver-wire should be introduced at a point ra-
ess than midway between the apex of the cleft and the free uvular mar-
the velum, taking care that it transfixes the tissues at some distance
the edges of the fissure, and that the point of its introduction on the

opposite side exactly corresponds with it. The ends of this wire are now t[o] be brought out of the mouth, and the loop left loose behind the velu[m] Next comes the division of the muscles, and then the paring of the edg[es] of the cleft. The object then, of passing the wire suture thus early, is, th[at] though *in situ*, it runs no chance of being divided by the knife during th[e] portion of the operation, whilst, by giving it a good hold of the palatal ti[s]sues I have alluded to, as soon as the V is removed, it can be immediate[ly] tightened, thus approximating the edges at once, and giving the patient a little breathing time (if without chloroform); and moreover enabling t[he] surgeon to clear the mouth entirely of clot, and to exactly adjust his remai[n]ing sutures without undue hurry and with greater nicety.—*British Medical Journal, June* 12, 1875, *p.* 772.

50.—ON THE TREATMENT OF HERNIA BY INVERSION.

By Dr. J. H. THORNTON, B.A., Surgeon-Major, Indian Medical Service, Civil Surgeon of Shahabad.

This mode of treatment, though mentioned in most surgical works, has never, so far as I know, been considered on its own merits, but merely as an aid to the taxis and the other measures usually employed in the reduction of hernia. My object in this paper is to draw attention to the efficacy of inversion alone, not only in reducible hernia, but also in many cases where the rupture has become strangulated, and to suggest that a fair trial should be given to a plan of treatment which possesses so many advantages and is attended by so little risk.

The treatment of hernia by inversion consists in placing the patient in such a position as to bring the force of gravity into play to reduce the rupture. This may easily be effected by raising the foot of the patient's bed, and keeping it supported at an angle of 45°. In this posture the intestines naturally gravitate towards the upper part of the abdominal cavity, and gradually draw in the ruptured portion. It is evident, from the nature of the case, that a force acting gradually and equally from within the abdomen must be far safer and more effectual than any pressure applied externally. The use of the taxis, however carefully applied, must almost always involve some bruising of the parts, which would have an injurious effect should the attempts at reduction be unsuccessful and an operation become necessary. Sometimes violent manual pressure is employed by the patient and his friends in repeated fruitless efforts to reduce the hernia, and in such cases very serious results are likely to ensue. Contusion of the tissues, extravasation of blood, congestion, inflammation, and even gangrene of the ruptured bowel may result from violent, protracted, and ill-applied manipulation. The various other measures sometimes resorted to, such as bleeding, the inhalation of chloroform, hot baths, purgatives, enemata, cold, &c., are all liable to the objections that they are uncertain in their operation, not suited to every case, and often attended with risk. The advantages of inversion over all these modes of treatment are, that it is generally effectual absolutely, safe, and universally applicable. It can be used by any person, at any time, and in any place; and should it prove unsuccessful in effecting reduction (which will rarely be the case unless adhesions have formed), the patient is in a more favourable condition for the performance of the necessary operation than he would be after the employment of the other methods. The following case illustrates the efficacy of this mode of treatment.

A man named Dhoree, aged forty-two, was admitted into the Charitable Dispensary at Arrah on December 4th, 1873, with strangulated hernia (oblique inguinal, right side). The rupture had frequently appeared before, and he had been able to return it without difficulty. On this occasion, however, he was unable to do so; and his friends, who made repeated attempts to *reduce the hernia*, were equally unsuccessful. The result of their interference was that severe pain set in during the night, and, finding him getting

worse, they brought him to the dispensary early in the morning. The assistant-surgeon saw him, and endeavoured to reduce the rupture by the taxis, with the assistance of chloroform ; but his efforts were unsuccessful. I saw the patient at 9 a. m., about thirty hours after the appearance of the rupture. He was in great pain and distress, the bowels had not acted since the hernia appeared, there was much prostration, and hiccough and vomiting had already set in. I ordered the foot of his bed to be raised and supported at an angle of 45°, and I directed that he should be allowed to remain in that posture, and that no further attempts should be made to return the rupture. The result was that in about twenty minutes the hernia disappeared, reduction having taken place spontaneously. The patient speedily recovered. In this case the taxis, aided by chloroform, had failed, urgent symptoms had set in, and inversion was tried as a last resource, failing which an operation must have been performed to save the life of the patient. The success of the treatment by inversion under such circumstances is a satisfactory proof of its value, and shows that it might be advantageously employed in most cases of strangulated hernia, before resorting to an operation.—*Lancet, August* 14, 1875, *p.* 243.

51.—CASE OF LONG-STANDING FISTULA IN ANO TREATED BY THE ELASTIC LIGATURE.

By Dr. J. C. Ogilvie Will, Assistant-Surgeon to the Aberdeen Royal Infirmary.

Among other purposes for which an elastic ligature may be employed, Professor Dittel mentions that of division of the tissues for the cure of fistula in ano; and though I do not consider that, as a rule, its use should be preferred to the cutting operation, in certain exceptional cases I think it may prove of advantage, of which the following is a well-marked example. The history of this case is reduced from a written statement supplied by the patient, and it certainly appears a very extraordinary one.

W. P., aged fifty-one, states that in the summer of 1854 he suffered from great weakness of his back and legs, and severe pain after being at stool. He was then treated for "spinal disease" by the actual cautery, blisters, and the application of leeches round the anus. After being subjected to this treatment for eight months he attempted to resume his duties ; but the pain after defecation continued, and even at other times he suffered so much uneasiness that, frequently after returning home at night, he applied leeches and poultices to relieve it. He continued in much the same state till August, 1864, when matter was observed issuing from an opening by the side of the anus. This discharge went on for eighteen months, during which period he had no pain at stool, but a feeling of great weakness and pain in the small of his back. During the next four years "red swellings" appeared from time to time round the anus, but with the aid of leeches and poultices they were got rid of. From 1870 to 1874 there was an occasional discharge of pus from a sinus, the flow sometimes continuing for three months, then stopping, and then again commencing; at times he could neither sit nor lie, but was obliged to walk about, which he found afforded greater relief than anything. In September, 1874, the pain while sitting increased, especially at one point on the inner side of the left buttock, where he could feel "something about the size of a pea, from which a hard cord extended to the anus." This swelling gradually increased, as did the pain; and he had again recourse to leeches and poultices, but, finding them of no avail, he applied to a medical man, who soon after requested me to see him.

On examination, I found a small opening in the perineum on the left side of, and distant two inches from, the verge of the anus. On introducing a probe, it revealed an indurated, deeply-seated sinus, ending some little distance above *the sphincter ; but no* internal opening could be detected. The *lower part of the gut was separated* from its surrounding structures to such

an extent that the point of the probe could be swept round fully half its diameter.

Some days afterwards I completed the fistula by making an internal opening in the gut above the sphincter, and passed in a probe armed with a solid elastic ligature (similar to that described by Sir Henry Thompson in the Lancet of Jan. 3rd, 1874), which I then, after detaching it from the probe, put tightly on the stretch and knotted securely. The ligature was considerably larger than the eye of a probe would admit, so I fastened them together by means of a thread of iron wire. At the moment when the ligature was being tied, the patient complained of considerable pain; but this soon passed off, and by the use of morphia suppositories he was kept quiet and comfortable. A pad of lint coated with an ointment containing salicylic acid was applied, and retained by a T bandage.

The ligature came away on the eighth day of the operation, and left a broad but healthy granulating surface, which gradually healed. The bowels were moved some days before the separation of the ligature, but its presence did not occasion any inconvenience.

In this case, on account of the length and depth of the fistula, considerable hemorrhage would, in all probability, have followed the use of the knife: moreover the patient was weak from long suffering, of extremely sensitive and nervous temperament, the subject of heart disease, and much averse to a cutting operation; therefore I think it was a peculiarly suitable case for the employment of the elastic ligature, as not one drop of blood was lost during the entire proceeding, and the shock of the operation was much less than it would have been had division by a cutting instrument been the mode adopted.—*Lancet, August* 7, 1875, *p.* 205.

52.—CASES ILLUSTRATING THE TREATMENT OF HÆMORRHOIDS AND PROLAPSUS BY THE CLAMP AND CAUTERY.

By Henry Smith, Esq., Surgeon to King's College Hospital.

[Pyæmia is well known to occur after operations upon internal hæmorrhoids. Mr. Smith has not met with a case which could be verified as such after this series of operations.]

Pyæmia after the use of the cautery is most unlikely to occur; it is odd, however, that I have not met with any cases, for it is often necessary to make extensive wounds in the integument, to which the cautery of course is not applied.

Erysipelas is a complication of which I must speak. In the 300 cases I had not one instance; but, curiously enough, in the last 100 I have had two—at least one of the cases was decidedly a well marked instance of the disease, spread over the whole of the buttocks and back, and nearly killed my patient. I may mention, however, that he had been terribly reduced by his disease, consisting of a huge prolapsus, and that I had to make extensive incisions for removing external tumours. Erysipelas was, moreover, very rife in my practice at this period. At this very time, and in the same neighbourhood, another gentleman got rigors, fever, and a large abscess in the buttock, from which he recovered although he was seventy-eight years old. I believe I took the erysipelas from my other patient to this. It has been a matter of surprise and congratulation to myself that I have not much more frequently met with erysipelas after this operation. I believe that the immunity is due in great measure to the action of the cautery—an explanation similar to what holds good in instances of burns; however extensive these are, it is a comparatively rare thing to find erysipelas attack such a wound.

I come now to the consideration of hemorrhage—the most important matter *in connexion with the operation* of the clamp and cautery. Important in *two senses; first, because* in reality the only objection to the operation

and, second, it is the result against which the surgeon has most to guard, and unless he takes very great care it is an occurrence very likely to take place. I find, moreover, from what has been written, and from conversation with my professional brethren, that surgeons dread the performance of the operation fom fear of this taking place. But I have no hesitation in saying that the bleeding which is most likely to be serious—viz., that which may take place immediately after the operation—ought not to occur, and that if it does happen it is either from the fault of the operator or from the use of defective instruments or an inefficient use of the cautery. As to my own results, I may state that in the whole of my 400 cases, which have included many of the severest kind and of huge size, I have never met with bleeding sufficient to necessitate plugging of the rectum ; and not one of the house-surgeons of King's College Hospital have ever had to resort to that measure. In fact, I have been astonished that a case has never occurred to me where this measure has been needful, as, especially in hospital cases, I have frequently been very sparing with the cautery, and have become emboldened by success from paying as much attention as I ought to prevent its occurrence. I have met with eight cases in which bleeding, either immediately on the operation or that which may be termed secondary hemorrhage, has taken place to such an extent as to demand very active measures short of plugging the rectum; and, curiously enough, at least six of these have occurred in my last series. I account for this—and glad I am, in one respect, to be able to say this—from my previous immunity causing me to take less precautions than I should. This little salutary experience, which I will relate, has made me doubly careful, and I do not think that my future results will show any similar mishaps.

The first case occurred in the person of a young woman in most miserable health, who had suffered terribly from hemorrhage and came into the hospital with severe hemorrhoids. I performed the operation with the clamp and cautery. A few days after she got pain in the pelvic region, with constitutional disturbance, and the action of the bowels was followed by smart bleeding, and it recurred on two occasions. It was arrested on each occasion by the injection of iced water, and she got quite well. I cannot take any blame to myself in this instance. Either some vessel must have escaped the action of the cautery, or the blood was in such an impoverished state that there could not have been coagulating power enough to close thoroughly the vessels. I have operated on many such cases, however, and have not had any bleeding; in fact, it is in such cases as this that I believe we find the special advantages of the cautery. I once saw, in a similar case, where ligature was employed, nearly fatal secondary hemorrhage ensue after the separation of the threads.

The second case occurred in a hospital patient, a man. Smart bleeding occurred after the action of the bowels, which, however, was stopped by the injection of iced water. In hospital cases I am not so particular in applying the cautery, as I know there is assistance handy if bleeding should occur. I think it very probable I did not cauterise sufficiently here. Both these cases were examples of secondary hemorrhage proper, which is very rare indeed.

Sometimes a good deal of blood is passed on the first action of the bowels. The patient gets alarmed, and I am sent for; but on examination it is found that the greater part of this evacuation consists of dark coagulated blood, which had evidently slowly escaped into the bowel after the operation, and had remained there until the action took place. The third and fourth cases were of this description. In the one the bleeding ceased spontaneously; but in the other some arterial blood was poured out, and my assistant, who was called to the case in my absence, was obliged to pass a large speculum into the bowel, screw it up, and allow it to remain until I arrived. This answered most effectually. Now in both these cases I take blame to myself. In each there was a mass of internal hemorrhoids, which I clamped and cauterised in the ordinary manner ; but, in addition, there was a large mass of external growths, covered partly by mucous membrane. I removed them with the scissors, but did not apply the cautery to the bleeding surface, as I have done since in instances where the muco-cutaneous growths, as I would term them, are *very large. When the* cut parts are returned after the operation, of

course the wounds which were external become converted, as it were, into internal, and vessels which have been divided and have not been cauterised are very liable to bleed. Many years ago I saw an early fatal case of hemorrhage from this cause.

The fifth case was an instance of bleeding coming on immediately after the operation, and, excepting the last case I shall mention—which, however, is not exactly similar,—it is the only instance of the kind I have met with, although I have been constantly expecting it, and have wondered at its non-occurrence. I operated on a gentleman for large internal hemorrhoids. In clamping the largest tumour, and after dividing it and cauterising, a portion of the cut pedicle slipped away, and on unscrewing the instrument I noticed a vessel bleeding freely; it retracted, however, and apparently ceased to bleed. I finished the operation, and returned the parts. In about ten minutes, just as my assistants and myself were about to take our departure, the patient suddenly called out that his bowels were about to act; and immediately a large gush of blood took place, making him very faint. I at once introduced a large silvered glass speculum into the rectum, when another large gush of blood took place, and the bleeding continued for some moments, but by pressing the speculum well in I stopped it very quickly. The speculum was retained for about a quarter of an hour, and the bleeding did not recur. This might have been a serious case if I had left the house; and doubtless I was very blamable, in the first place, for allowing a portion of the pedicle to slip, and, in the next place, for not applying the clamp again and cauterising the vessel, which of course had not been touched at all by the hot iron.

The sixth and last case was one of a peculiar character. It occurred last July, in the person of a gentleman who suffered severely from internal hemorrhoids; one was a large solid growth, more like a polypus, and having a thick solid pedicle. Before putting on the clamp I made a free incision around its circumference, and in doing so I wounded a large vessel; it spouted forth its contents over me, and then retracted, and, as I supposed, ceased to bleed. I embraced the tumour with a large clamp, inserting the blades into the cut surface, and removed the growth, freely cauterising the pedicle. In about an hour the patient felt very faint, and was obliged to resort to measures to relieve this; shortly afterwards, however, this condition passed away, and he felt pretty well until about forty-eight hours after the operation, when he had a strong desire to evacuate the bowels, and he passed a large quantity of coagulated blood. He made a very quick recovery. Now in this case there was a very narrow chance of the patient having a serious hemorrhage, and I was much to blame; for there can be no doubt that the large vessel which I had divided, and which had apparently ceased bleeding, burst out afresh on the completion of the operation, but was arrested by two causes—namely, the fainting, and the coagulation of the blood acting as a plug. I ought not to have trusted to the powers of nature to arrest bleeding from so large a vessel, but should have drawn the part down and have clamped and cauterised that as well as the rest of the pedicle.

It is a somewhat curious circumstance that in the majority of the cases where bleeding occurred it happened in the last series of operations, and I have no doubt is entirely explained by the fact that repeated operations at an earlier period of my practice without any hemorrhage occurring had made me bold and somewhat careless; for when I first began to perform this operation I had a constant dread of hemorrhage, and used to apply the cautery so freely that bleeding could not take place. I have, however, since the occurrence of the cases I have detailed, returned to my former method of free cauterisation, and I do not believe I shall get any further cases of bleeding.

One other point in reference to the result of this operation, about which I have often been questioned, is as to the liability to the occurrence of stricture. My experience shows that stricture is not likely to occur from clamping and cauterising mucous membrane, but it is just as likely to occur after this operation as after any other operation when the skin is too freely dealt with. I *have had three* cases where, from this cause, cicatrisation of the skin caused *a contraction of the* anus; and hence I am extremely careful about the *removal of skin*, and only adopt this measure where there is an abundance of

this tissue, or where, in consequence of great weakening of the sphincter, it is necessary to produce firm cicatrisation. If, however, I am obliged to remove skin at all freely, I always make a patient use a bougie for a few weeks.

In one instance only have I met with a case where a fistula resulted. In this case I had not the charge of the after-treatment, and therefore do not hold myself responsible for the result.—*Lancet, July* 24, 1875, *p.* 124.

33.—ON THE TREATMENT OF HÆMORRHOIDS, AND THE COMPARATIVE MERITS OF THE OPERATION BY THE CLAMP AND BY THE LIGATURE.

By James R. Lane, Esq., Surgeon to St. Mary's Hospital.

The result of Mr. Smith's experience of 400 cases forms, without doubt, a very valuable contribution to practical surgery; and when we learn that out of this number he has only met with four deaths, it will, I trust, help to allay the vague apprehension which exists, even in the profession, respecting the risks attending operations for this disease. But I contend, at the same time, that he has not yet succeeded in demonstrating the superiority of the clamp and cautery over the ligature; and I do so on the following grounds. I have myself operated with the ligature, at St. Mark's Hospital and elsewhere, on more than 800 cases, with only three deaths; while Mr. Allingham, in his book published in 1871, states that he had then operated on 400 cases, without any death at all. With respect to pyæmia, no death from that cause has occurred in my experience, and Mr. Allingham states that 3210 cases in St. Mark's Hospital have not furnished a single example of it, though he refers to four cases of death from that cause in the practice of other surgeons after the operation with the clamp and cautery. I have no desire to maintain that the ligature possesses in this respect any peculiar advantage over the clamp, for I believe the tendency towards pyæmia will, in the long run, be found to be about equal in both; but the facts which I have stated effectually dispose of the peculiar immunity from pyæmia formerly claimed for the clamp by Mr. Smith, and also of his recently expressed opinion that "the complete sealing up of the vessels produced by the hot iron is the very best safeguard against pyæmia we can have." I am quite at a loss to see how vessels are more completely sealed up by cautery than by ligature; a fact, if the argument is worth anything, the ligature ought to be superseded by the cautery in surgical operations wherever practicable, in order to diminish the liability to pyæmic infection.

The most serious objection to the operation with the clamp is its liability to be followed by hemorrhage. Mr. Smith himself now candidly speaks of this as 'the result against which the surgeon has most to guard, and unless he takes very great care it is an occurrence very likely to take place." He mentions cases in which it took place to a rather serious extent immediately after the operation, and others in which it occurred a few days afterwards, when the bowels were relieved. In the latter it probably arose from the vessels being reopened in consequence of the slough being detached or disturbed during the passage of the fæces over the wounded surface—an indication that they are not so efficiently closed by cauterisation as when they are securely embraced by a ligature. A lesser degree of hemorrhage seems to be not unfrequent, for we are told that "sometimes a good deal of blood is passed on the first action of the bowels, and on examination it is found that the greater part of this evacuation consists of dark coagulated blood, which had evidently slowly escaped into the bowel after the operation, and had remained there until the action took place," another indication that all the divided vessels are not completely closed by the cauterisation.

Were it not for the danger of hemorrhage there would probably be little to choose *between the two modes of operation*; they are, in fact, only different

ways of doing the same thing. From what I have seen I believe them to be as nearly as possible equal as regards the danger to life, and also as regards the ultimate result, the subsequent pain, and the time required for recovery, and I have seen nothing to justify the assertions that the method with the clamp is in any of these points superior to the other. But the danger of bleeding, which is confessedly a real one, is sufficient, in my opinion, on Mr. Smith's own showing, to justify the condemnation of the operation with the clamp in all cases where the disease is far advanced and large vessels are involved. One of the fatal cases which he records is significant. It is that of an elderly gentleman with very severe prolapsus. A very vigorous application of the cautery was necessary to arrest the bleeding, and the patient died on the fifth day from peritonitis. Mr. Smith does not doubt that the peritonitis was produced by the excessive employment of the cautery, and thinks it possible that he may even have injured the peritoneum. Surely in any case where there is a chance of such severe cauterisation being required, the operation with the ligature must be the safer of the two. I have myself never hesitated to use it in the most extensive cases of disease, and I have never yet had occasion to repent having done so.—*Lancet*, *July* 31, 1875, *p.* 162.

ORGANS OF URINE AND GENERATION.

54.—VARICOCELE, AND ITS CURATIVE OPERATION BY SUBCUTANEOUS WIRE LOOP.

By Richard Barwell, Esq., Surgeon to Charing Cross Hospital.

The mode of operating on nævus by subcutaneous wire loop, which I advocated in a former paper (p. 198), is, with certain modifications, also applicable to the curative operation for varicocele, and is, I believe, the safest means of destroying the varicose veins at this part. Before, however, describing this method, it would be well to say a few words concerning the malady, and the motives which should cause us to operate or to abstain.

The veins of the lower cord may become varicose from a number of causes, and yet the disease is rarely seen on the right side. When we consider that the malady may follow a blow, of which causation I have seen two examples, and that it may very commonly be traced to evil habits in youth, it would seem strange that such occurrences, which certainly ought to affect both sides, only produce varicocele on the left, rarely on both, hardly ever on the right alone ; I say this would seem strange did we not take into account the predisposing causes, of which there are two : one, the termination of the spermatic vein, usually held to be all-sufficient ; the other, and in my belief the more important, being the position of the lower part of the colon across the vein, which intestine, being in careless youth often overloaded, affords a marked obstacle to the return of venous blood.

Whatever the immediate cause may be, we find within the scrotum of a person thus affected the enlarged veins, aptly compared to a bunch of earthworms, extending from the testicle upwards, the scrotum on that side lax and long, the testicle smaller and softer than the other, and often the seat of sharp, lancinating, more or less frequently recurrent pains, as well as of continuous aching, sometimes dull, sometimes severe.

Now, these two points—the flabbiness and smallness of the testicle, and the frequency or severity of the pain—should cause us to recommend or withhold operation. There is no doubt that a slight or moderate degree of varicocele may be kept in abeyance, may even be improved, by the use of a suspensory bandage or of a truss, and under such circumstances the malady will be painless. The testicle will hardly diminish in size. Nevertheless I believe that *cure of this complaint* by such means is excessively rare, nor do I think that

the testicle from which the varicocele springs is of much use. But as long as the organ retains a certain amount of hardness and of size, I do not feel justified in recommending an operation, and if no very palpable difference in the two organs be present, I should even strongly dissuade a patient from such procedure, unless he were suffering much pain. On the other hand, if the testicle of the affected side be markedly small and soft, particularly if the diminution have been rapid and be still going on, I should recommend obliteration of the veins, even though the accompanying pain were trivial; *a fortiori*, I would strongly recommend it if the pain be pretty severe. Even considerable pain alone (neuralgia being eliminated) is sufficient justification for operation by a method which, in my experience, is free from danger.

I cannot say that freedom from danger is the quality of every operation for varicocele. The plan of passing two needles beneath the veins, the one a short distance above the other, casting round each a figure-of-8 ligature, and dividing the vessels between them, has not infrequently been followed by pyæmia and death. Ricord's subcutaneous ligature is in many ways imperfect; pyæmia has resulted from it, and return of the disease also occurs. Other methods might also be named, such as Tufnell's substitution of wire for the thread which Ricord uses, and this is doubtless the best that has hitherto been described. Among the objections to it is complication.

The method which I adopted several years ago, and which I have very frequently used, is as follows:—First, it is most important that the vas deferens and spermatic artery be separated from the veins. This is best done by the surgeon standing on the patient's left (supposing the disease to be on that side) and taking that half of the scrotum, about an inch above the testicle, between the left finger and thumb, and feeling for the duct by rubbing the two surfaces of the bag gently together while its walls glide from his grip. When he has thus brought the duct and artery from among the venous plexus and holds them between his thumb and finger-tip, he must let them away to the back, so that he will enclose the veins within the circle of his finger and thumb and exclude from it the artery and the vas deferens. The digit tips and slightly compressed scrotum will separate the one set of vessels from the other. If, in seeking for the duct, the surgeon have allowed a few veins to slip away with it, he can begin again, with the advantage of having no longer the whole mass, but only a few vessels, to deal with. If he be not sure of having successfully isolated this important part, he must examine the condition of things with his right hand while keeping the left in the same position. Supposing this separation accomplished, the bit of scrotum between the finger tips is to be squeezed rather tight, and a needle, armed with iron or silver wire, not too fine, thrust straight through above them. Now the part may be released from grasp, and the needle passed in again at the puncture of exit, in front of the veins, and out at the first place of entrance. Thus at one opening protrude the two ends of the wire, and at the other a loop; by drawing on the ends the loop is pulled into the scrotal cavity, and closely surrounds the varicocele. Each end is passed through a hole in the little instrument I depicted in my former paper, and drawn tight enough to make the veins below swell, bulge, and partly consolidate. Every other day, or every day if time be an object, the wire may be tightened until it has cut through all the consolidated veins, and has come away. No suppuration or apparent inflammation accompanies the process. The patient need not be confined to his bed after the first forty-eight hours.

One caution must be given. In passing the needle the second time—i.e., in front of the veins,—its course must be entirely in the cavity of the scrotum. If, from over-anxiety to include every vein, or from other cause, some of the lining fascia be strangulated in the loop, the case will be considerably retarded, and some amount of suppuration, accompanied by swelling in the walls of the sac, is likely to ensue. The operation, well performed, is very slightly painful. I have several times completed it without any anæsthetic. Neither is it followed by pain; indeed, where aching of the testicle has previously been pretty severe, relief is the immediate result.

Rather than give the details of any one case, I prefer to offer here an analysis of *my results. I have operated* on thirty-two cases. Not one has been fol-

lowed by shiverings, erysipelas, or other dangerous symptom. Three had some suppuration: the pus found its way out of the first puncture in two of these; in the third, a small abscess formed in the walls of the scrotum, an opening a third of an inch long emptied it, and it rapidly healed. In every case the testicle has begun to resume its size and hardness soon after operation. Those that returned to observation after a year or more were found to have quite recovered normal condition, except one. Two cases I saw after five and after seven years. The former had, through bad habits, a double varicocele; the testicles, previous to operation, were very small and soft; he was pretty nearly emasculate; now the organs are firm, healthy, and very good. The other, seen after seven years, had become the father of two children, stated to be strong and healthy. The one case referred to above, which after two years had not recovered normal condition, was one of left varicocele; the testicle was at the time of operation quite flabby; it was at the end of two years certainly better, but still very soft, and the patient believed it to have regained function; and the man was a very feeble person, of phthisical history. Although I have asked all my patients to call upon me in case there were any return of the disease. I have never seen one of them with such complaint.—*Lancet, June* 12, 1875, *p.* 830.

55.—ON A NEW URETHROTOME FOR INTERNAL URETHROTOMY.

By Dr. Patrick Heron Watson, F.R.S.E., Senior Surgeon to the Royal Infirmary, Edinburgh.

I have no wish to enter into any consideration at present of the advantage of one method of treating stricture of the urethra as compared with another. I believe that dilatation, divulsion, external and internal urethrotomy, have each their separate sphere, and form an efficient armory, from which a skilled surgeon will, according to circumstances, select his appropriate weapon. I wish at present merely to direct attention to a new instrument which two years ago I had constructed for the internal division of strictures of the urethra. It has seemed to me much more satisfactory than any other form of instrument, intended to effect internal urethrotomy, with which I am acquainted.

The original instrument I had constructed for me in Paris, under the direction of my former resident surgeon, Mr. C. W. Macgillivray, by Luer, of Paris, but as its size was too large for the treatment of very tight strictures, I had a modified instrument, upon the same principle, constructed by Mr. Young, of this city. It consists essentially of a Syme's stricture staff, from which a tenotomy blade is made to protrude at an angle on turning from left to right a wheel fixed at the proximal extremity of the instrument. This instrument is probe-pointed at the distal extremity, and the size of a No. 10 or 12 at the haft. The instrument gradually increases for four inches from the fine probe-pointed extremity, up to the size of a No. 2 bougie. Here it abruptly enlarges to the size of a No. 12. At this point, where the thick and thin portions of the instrument are continuous, a tenotomy knife-blade, concealed in a groove in the slender part of the shaft, is so pivoted that it can be projected at an angle with the commencement of the thick portion of the staff. The degree of angular projection of the knife is determined by the number of turns given to the screw attached to the handle of the instrument, and this degree of protrusion is marked by an indicator on the shaft. For the purpose of cleansing the instrument after use, the blade can be screwed out to a right angle to the shaft; but in use, when dividing a stricture, no protrusion beyond an angle of 45° is required. The instrument in all its parts, except the blade, is nickelised to prevent rusting.

When employed the instrument is introduced with the blade enclosed in *its groove.* When the pointed extremity has been insinuated through the *stricture part of the* canal, it glides smoothly onwards towards the bladder, till *the anterior extremity of* the stricture arrests the progress of the thick portion

aff. The anterior extremity of the stricture is thus determined with precision, and as few strictures exceed an inch and a half in length, e is sufficiently long to secure the division of the stricture with one it of withdrawal of the whole instrument. When once the instrus been lodged in close contact with the stricture, the screw in the e turned so as to secure a protrusion of the blade to an angle of 30°, le instrument is then drawn forward as if to withdraw it from the cahen this is at first attempted it is felt to be firmly held, then the tisld. When the instrument has been withdrawn about two inches from hra, the screw is inverted, causing the blade to retreat completely groove, and the passage of the whole instrument onward towards the is once more attempted. In most instances this is found unopposed. t be so, the urethrotome is withdrawn, and a full-sized catheter passapty the bladder. Should the passage onwards of the thick portion strument be opposed, either another stricture or some portion of the dcture is shown to be undivided. A reprotrusion of the blade, and m of the movement of withdrawal, will secure the division of this ob-, and similarly of any other constriction which may still oppose the of the full-sized portion of the stem of the instrument.

e never encountered any troublesome hemorrhage in the use of this ent, while by means of it the extent of tissue divided has always mpletely under control.

dvantages which this instrument has seemed to me to present are:— stermines accurately the interior aspect of the stricture, while the s been insinuated through the contraction. 2. It divides the stricm behind forwards. 3. It enables the operator, by the abrupt shoulthe shaft, to determine whether, by the use of the cutting apparatus, cture has been completely or only partially divided, and admits of his ting the division if need be, without any change of instrument, by repeating the same steps of operative procedure, as in the first in-

4. It limits the section of the urethra to the part or parts which are y contracted, and does not "promenade" the whole canal. 5. Its use ided by remarkably little pain or bleeding.

he arrangement of the wheel and screw admits of no yielding of the even in fibrous, cartilaginous, or resilient structures, in which cases I hiefly employed it, the section of tissue is effected with absolute certhe gradual angle or wedge-forming position of the knife to the stem instrument securing that the cutting edge will act against all tissues hich it is brought in contact as the instrument is withdrawn. Neive I found any difficulty in retiring the blade within its groove when tion is complete, the fitting of the parts securing them against the le interposition of any portion of the surfaces of the divided soft tis-

strictures situated in the anterior portion of the urethra, an instrument ucted precisely in the same manner, but shorter and quite straight, is

I find myself, however, that the ordinary curved instrument is quite ent for every purpose.

cutting-blade has its edge turned towards the floor of the urethra, but be constructed to act upwards if so desired, or to work with a double- knife, both upwards and downwards. I prefer myself that the incision d be made only in one direction, and that downwards or towards the f the canal.—*Lancet, Oct.* 23, 1875, *p.* 585.

56.—ON THE TREATMENT OF CERTAIN CASES OF STRICTURE OF THE URETHRA BY A COMBINATION OF EXTERNAL AND INTERNAL DIVISION.

By THOMAS ANNANDALE, Esq., F.R.S.E., Surgeon to the Edinburgh Royal Infirmary.

Cases of stricture of the urethra, complicated with numerous fistulous openings, and great thickening of the perineal and scrotal tissues, are well known in the experience of practical surgeons. There is also little doubt that the recognised treatment of this condition is a free external division of the perineum and strictured portion of the urethra. The difficulty of thoroughly dividing the entire strictured portion of the canal in these cases is only recognised to its full extent by those who have performed this operation. I have witnessed this difficulty in the hands of the most skilful operators, and I have myself experienced it on several occasions. Especially is this difficulty met with when the stricture is a tight one; for the accurate division of the affected part of the canal on Mr. Syme's staff, or without it, at a depth of from three to four inches (the increased depth depending on the thickening of the perineal textures), is a proceeding not easy to accomplish.

Another difficulty in such cases is the fact that a considerable extent of the urethra is often involved, or several strictures may exist, and experience shows that unless the whole urethra be properly dilated, a good result cannot be expected.

A few weeks ago a patient was admitted into my wards suffering from an aggravated form of this condition. His name was G. M. B., and he was 45 years of age. He had suffered from stricture of the urethra for four years, and about eighteen months before his admission abscesses formed in his perineum, buttocks, and scrotum, and gave rise to numerous fistulous openings in these situations. An examination determined the existence of a tight stricture of the urethra in the region of the bulb and anterior to it. The stricture was nearly two inches in length, and in addition there was a stricture, not so tight, in the anterior part of the urethra, about two inches from the meatus. There were five or six fistulous openings in the perineum, and several others in the buttocks, close to the anal orifice. The whole perineal textures were much thickened, and several hardened nodules of skin and cellular tissue were scattered through this region, resembling somewhat in appearance those occasionally met with in cancerous disease. The whole of the urine was passed through the fistulous openings. With some difficulty a No. 2 metal catheter could be passed through the stricture into the bladder.

In considering the treatment of this case, I knew that it would be necessary to freely incise the middle line of the perineum, and also to divide the strictured portion of the urethra, in order to obtain a cure of the affected parts; but I also knew from experience something of the difficulties in successfully carrying out this proceeding. I was therefore glad to avail myself of a hint which I received in reading some very interesting papers on stricture of the urethra, by Professor Otis, of New York, for his suggestion seemed to me to be one likely to be very valuable in certain cases of the kind under observation. Professor Otis, having a case of stricture complicated with fistulous openings to treat, first incised the perineum, and opened the urethra externally to a slight extent, and then introduced a urethrotome, and freely divided all strictured portions of the canal.

Taking a lesson from this case of Professor Otis, I operated on my case in the following way:—

Having passed a No. 2 silver catheter through the strictures into the bladder, I made a free incision in the middle line of the perineum, through the thickened tissues, and opened into the urethra immediately behind the point of the posterior stricture. I made no attempt to divide the stricture by this external incision, but, having removed the catheter, I introduced along the urethra into the bladder the fine grooved staff of a urethrotome (one after Maisonneuve's principle), and then, by passing the knife of this instrument *along the whole length* of its groove, the entire strictured portions of the

are thoroughly divided. The whole operation did not occupy more ew minutes, and I was much impressed with the advantages as regards l quick performance over the method of external division as usually d. A No. 12 catheter was readily passed into the bladder after the ope- and was retained there for twenty-four hours. The patient's progress e operation was in every way satisfactory. The thickening of the tis- dually but entirely disappeared, and the fistulous openings soundly The urine now comes freely by the natural way, and a No. 12 bougie easily passed along the whole course of the urethra into the bladder. ration wound in the perineum has nearly closed, and not more than of urine passes occasionally through it.

ond case of urinary fistula was shortly after admitted into my wards, s treated in the same way, with a like good result. The following is a te of this case:—

., æt. 40, admitted on the 23rd of March. He had suffered from e of the urethra for five years, and six months before admission ab- formed in the perineum and scrotum, and caused fistulous openings in situations. On admission there was a fistulous opening in ineum, and another immediately anterior to the scrotum, with thick- f the surrounding textures; all the urine was passed through the fis- openings. The introduction of a bougie discovered a tight stricture lately anterior to the scrotum, and a second one in the region of the

he 25th, an operation similar to that performed in the first case was suc- ly carried out. The result of this operation was also most satisfactory, e patient was dismissed cured on the 24th of April. A No 12 bougie be readily passed along the whole of the urethra into the bladder, the ning of the tissues had entirely disappeared, and the whole of the urine l freely by the right way.

s plan of operating appears to me to be well worthy of the notice of ns. I do not advocate it in cases of stricture, other than those of the cases related are illustrative examples, but I have no hesitation in ly recommending it in suitable cases. Internal division is becoming and more recognised in this country as the safest and most efficient ent of strictures of the urethra which do not yield to simple dilatation, y extended experience of this operation during the last few years has me a firm advocate of it in proper cases.

combination of internal division with external division in complicated ures such as have been just illustrated by these cases has, in my opin- he following advantages over external division alone:—

The complete and accurate division of all strictured portions of the ure-

Its easy accomplishment.

cases of complicated urinary fistula, in which the stricture of the ure- is impassable to instruments, or a portion of the canal is obliterated, I d in the first instance endeavour to re-establish a passage by external ion; and then, if any portion of the urethra could still be felt to be ured, I would introduce the urethrotome, and freely divide by internal ion such contracted portion.—*Edinburgh Med. Journal, June*, 1875, 04.

-ON THE CONVERSION OF MR. WAKLEY'S STRICTURE DI- ATOR INTO A CATHETER STAFF WITH SLIDING CATHETER OR URETHROTOMY.

By W. F. Teevan, Esq., B.A., Surgeon to the West London and St. Peter's Hospitals.

the last editions of the various English surgical text-books be examined, ill be *found that the staff illustrated* and described for the performance *xternal urethrotomy is much the* same as the one which Tolet, the inven- *f the operation, used two* centuries ago. True it is that some few sur

geons have divided strictures on a hollow staff, and that others have employed a catheter staff ; but I am not aware of any staff in use by the profession which is free from both the objections which attach to the common staff for urethrotomy. When the ordinary staff has been passed down the urethra, the question to be asked is this : Where has it gone to ?—is it in the bladder ? Unless this interrogatory can be affirmatively answered, the surgeon who operates is exposing his patient to risk. It is not sufficient for the surgeon to say that he thinks the instrument is in the bladder; he ought to be sure that it is there, as surgeons have before now operated when they thought the staff was in the bladder, and it has turned out that the instrument had been passed into a false route. With the ordinary staff one cannot be certain where it has gone to, and to remedy the defect, a hollow staff has been used. The second objection is not so grave. When the ordinary staff is employed its shoulder marks out where the stricture begins, and accordingly the surgeon possesses the requisite information to enable him to fix, accurately, the spot for piercing the tissues; but, on the other hand, he does not know exactly where the stricture ends, and is obliged to grope about and feel his way bit by bit. Hence it is that when the staff is withdrawn it is sometimes difficult, and occasionally impossible, to introduce a catheter into the bladder, either because some distal tags of the stricture have not been divided, or that the incision into the urethra forms a kind of bay-window in which the catheter catches. Mr. Marshall has remedied this latter objection by adopting Mr. Thomas Wakley's principle of sliding an elastic catheter over the staff which thus served as a guide. Unless, however, the situation of the staff is absolutely assured, this remedy is of but secondary value. Everything hinges upon the position of the instrument.

Some time ago when searching for a guide for subcutaneous urethrotomy that would be free from the objections alluded to, I perceived that if a longitudinal piece were cut out of the convexity of the metal catheter employed by Mr. Thomas Wakley, a groove would then be formed for the knife to run in ; and that if a slit were made in the ferrule of the elastic catheter, there would result, from the alterations effected, a compound instrument possessing advantages not attached to any similar one, so far as I was aware of.

Mr. Thomas Wakley's instrument consists, as is well known, of several distinct parts. A metal catheter; a long rod to be screwed into the metal catheter; an elastic tube or catheter open at both ends to be slipped over the united rod and catheter till it arrives at the structure ; and, lastly, a small movable handle which can be passed over and down the rod till it reaches the upper end of the elastic catheter, against which it is screwed tightly, so as to keep its vesical end well pressed against the obstruction. Now if we cut out a long narrow piece (about two inches in length) from the convexity of the metal catheter, we have at once made a groove for the knife to run in. This groove ought to terminate an inch and a half from the eye of the instrument. The next step is to have a slit cut in the metal ferrule of the elastic catheter for the knife to be inserted into it, and conducted thence into the groove in the metal catheter which ought to be in the same straight line as the other one. A notch ought to be made on the upper end of the elastic catheter, and on the same side as the slit in the ferrule is placed, in order that the assistant may know which surface to keep to the surgeon's front.

Whether the operation be subcutaneous or external urethrotomy, the metal catheter is first passed into the bladder, and if urine issues from the instrument the operation may be proceeded with. If, however, no water comes out, it may be assumed that the catheter is in a false passage and it must be withdrawn, and an attempt made to pass it into the bladder. Unless, however, the position of the instrument can be proved by the fact of the urine flowing from it, no operation ought to be undertaken. Provided the water escapes, the long rod may then be screwed into the catheter, and the elastic tube passed over and along it till it is stopped by the upper end of the stricture. The assistant then takes care to place the notch on the upper end of the elastic catheter so that it may face the surgeon, and having screwed on the handle and made the convexity of the metal catheter to project well in the perineum, the surgeon feels for the metal ferrule of the elastic catheter at A,

pierces the strictures in a downward direction, keeping the back of his knife to the staff. The further steps of the operation will differ according as it be subcutaneous or external urethrotomy. When the surgeon thinks he has completely divided the stricture he can prove the accuracy of his supposition by trying to slide the elastic catheter into the bladder whilst holding the upper end of the metal rod in position. If all the stricture be divided the elastic tube will glide smoothly into the bladder, where it can be left or not, as the operator may desire. The metal catheter is then withdrawn through the elastic one, which it leaves *in situ*. Should the elastic catheter be obstructed at any point in its progress the knife must be introduced again, and any remaining tags or stricture cut through.

Mr. Thomas Wakley's instrument, modified in the way I have described, will be found invaluable for the performance of external or subcutaneous urethrotomy.—*Lancet, May* 29, 1875, *p.* 755.

58.—CASE OF PERINEAL SECTION, FOLLOWED BY THE OPERATION OF DR. OTIS, FOR THE CURE OF FISTULA IN THE PERINEUM.

By WALTER COULSON, Esq., Surgeon to the Lock and St. Peter's Hospitals, London.

The following case, considerably abridged, may serve as an introduction to some remarks on perineal fistula, and on the operation for stricture proposed by Dr. Otis, of New York, and recently performed in this country.

The case is that of Robert D., aged forty-four, seaman. About five years previous to his admission for the second time into hospital he had been treated for stricture, as an in-patient, by dilatation, at Guy's Hospital.

Two years ago (1873) he was admitted with extravasation of urine following retention. This condition was relieved by free incision of the perineum. The patient made a good recovery, but a perineal fistula remained, which it was hoped might be closed by continuing dilatation of the stricture. At the time of his leaving the hospital a No. 5 silver catheter (English scale) could be passed into the bladder; but the man neglected to attend as an out-patient, and when re-admitted, in May, 1875, he was unable to pass any urine naturally, the whole of it escaping in a small stream through the perineal fistula. The passage of the urine now causes great pain and scalding, which continue for some time after micturition; he suffers from a constant desire to micturate, the urethra is excessively sensitive, the urine loaded with mucus and pus, and no instrument can be passed into the bladder. Up to the 17th of May several attempts had been made to pass elastic instruments into the bladder by the penis and through the perineal opening, but they failed. He has been taking fifteen minims of sandalwood oil three times daily, which has materially diminished the muco-purulent deposit in the urine, but has had no effect in diminishing the scalding. On two occasions he had retention of urine, which was relieved, after some difficulty, by insinuating a small elastic instrument through the fistulous opening into the bladder, but all attempts to pass an instrument along the penis from the meatus were unavailing. However, an extremely fine elastic bougie could be passed along the penis and out at the perineal opening.

On May 17th I performed the following operation:—A No. 8 steel bougie was passed down along the urethra, as near to the fistula as the thickened structures surrounding it would permit. A free incision was then made through the fistulous opening, and the adjacent strictured portion of the urethra was freely divided. A straight-grooved director was then passed through the wound into the bladder, the edges of the fistula were pared, and a No. 16 French elastic catheter was introduced into the bladder, the straight director *acting as a guide. The catheter* was tied into the bladder, and there re*tained until the following evening.* No bad symptoms followed the opera-

tion, and the temperature of the patient remained unchanged. From this date until July 19th, both continuous and occasional dilatation was employed, and the edges of the wound were from time to time touched with caustic. The perineal wound became merely a fissured opening, but still it would not quite heal, and on every occasion that the patient passed water, some portion of the urine escaped through the fistula. The question then presented itself whether the fistula might not possibly be kept patent by some constriction in the penile portion of the urethra. With the assistance of Dr. Otis, an examination was made with the urethrometer, and the existence of three distinct points of constriction was demonstrated. It was therefore resolved that resort should be had to his operation. The patient was placed under the influence of ether administered by Mr. Knott, and the urethrotome of Dr. Otis was passed down as far as the fistula. The instrument was then made to indicate a dilatation corresponding to 32, French scale, and the three points of contraction were freely divided. The last-mentioned result was verified by the introduction of the bulbous sound, which was passed down as far as the fistulous opening, and withdrawn without a catch. A cylinder, open at both ends, and about five inches long, was tied into the urethra after the operation, and was allowed to remain in for six hours. This was done at the suggestion of Dr. Otis, but the cylinder was removed at the patient's request, as there was no sign of bleeding; the loss of blood after the operation was also slight. From the date of the operation, July 19th, to the 24th, no unfavourable symptom manifested itself. A No. 32 bougie was daily passed along the urethra to prevent adhesion, and the patient left the hospital cured. When he reported himself to me, Aug. 16th, the fistula was completely healed.

Before making any observations on this case, it may be well to notice the principal features of Dr. Otis's new operation.

The method of Dr. Otis is based on the simple proposition "that in all contractions of the urethra the contractile points must be reduced to the normal calibre of the urethra in its healthy state." This applies to all deviations, and, in Dr. Otis's view, especially to "comparatively slight contractions," which are not usually considered as requiring operative treatment. The term "slight contractions" refers to strictures which only admit 8 or 9 of the English scale. Dr. Otis maintains, as I have said, that any deviation from the normal standard, however slight, should become the subject of operative interference. The urethra must be brought back to its "normal calibre." But what is this normal calibre? According to Dr. Otis, "the capacity of the urethra always bears a constant relation to the size of the individual penis, which latter varies greatly in different individuals."

Thus, in the past year alone, Dr. Otis examined more than one hundred urethræ carefully. His conclusions are that the flaccid penis varies from three to four and a half inches in circumference, according to the individual, and that the circumference (or capacity) of the urethral canal varies from 30 to 40 of the French scale. Also, if we reduce the tables, every increase of one quarter of an inch in the circumference of the flaccid penis implies two degrees increase (as French scale) for the capacity of its urethral canal. Besides this, the urethrometer devised by Dr. Otis furnishes, according to him, in all cases, the exact normal calibre of the urethra; and to this calibre the diseased urethra must be brought in order to ensure a cure.

From what precedes, it follows that the surgeon must begin by ascertaining the normal calibre of the individual urethra. This ascertained, we have various methods of "sundering" the stricture at some point. The selection must rest on the judgment of the operator; but whatever method may be selected—whether rupture, dilatation, or division—*every* fibre of the constricting tissue must be completely severed, or subsequent recontraction is certain.

To ensure the attainment of these objects, Dr. Otis has devised a new form of urethrotome, which combines dilatation with division, though the object of dilatation is chiefly to enable us to apply the edge of the blade more surely to the structures which we intend to divide, and thus to protect, or nearly *so, the healthy portions* of the canal. All the bands which obstruct the canal *must be divided* one after another, if not detected at first. Dr. Otis never

s dilatation after the healing of the wound made during the opera-
The incision is along the superior wall of the canal, against which the
g portion of the instrument forcibly presses the blade. The use of the
after the operation is simply to separate the divided surfaces, not to
The after-treatment consists merely in separating the wound through-
extent by the easy passage of a full-sized steel sound daily, or every
ay, until healing is complete. Finally, as recontraction of stricture
peration is simply due to incomplete division, and as the latter, as a
ill be detected within one or two weeks, the cure may be considered
te after the expiration of that time if no change of calibre be detect-
or a second operation, however, Dr. Otis frequently employs one of
lier urethrotomes, which cut only at a single predetermined point, and
des of which are not protected by a guard. He also maintains that in
g-standing cases of gleet contraction exists in some point of the ure-
anal, and that such cases are cured by his operation. I am collecting
such cases myself, of not less than two years' duration, in which the
ion has been performed. The results of these I hope to make known
e future time. Meanwhile a few observations may not be out of place

operation just described, and the instruments employed, seem to pre-
lvantages over any other operative methods with which I am acquaint-
the internal division of strictures in the penile portion of the urethra,
o far as the mere division of the strictured part is concerned, it fairly
all which the author claims for it. Another advantage which Dr. Otis
ites to his method of operating is that recontraction does not take place
icatrisation of the divided tissues. If this be fully confirmed by sub-
t experience, we must admit that the new operation effects what no
operative proceeding has effected—viz., a radical cure of stricture;
to say, a condition of the urethra which shall require no future intro-
n of instruments.

ongst the complications arising from stricture, extravasation of urine,
njury to the urethra, there are few which occasion more inconvenience
patient and trouble to the surgeon than perineal fistula. In D.'s case
mplication resulted from an operation performed for the relief of ex-
ation, and, dilatation having been tried and failing to close the fistula,
al section was for a second time resorted to; but, in spite of this ope-
and subsequent dilatation, the fistula remained open.

e result af Dr. Otis's operation certainly proved that slight contractions
are not usually recognised as strictures may offer obstruction to the
ge of the urine sufficient to prevent a urinary fistula from healing. The
of the internal division of the strictures and the daily introduction of
ized instruments left the mucous wall of the canal, after complete cica-
ion had taken place, as supple and non-resisting to the passage of the
ized sound as a perfectly healthy urethra. Dr. Otis finds that this con-
n has continued for three years after the operation, and believes this re-
o be due—(1st) to complete division of every fibre of the stricture, and
) to the prevention of contraction of the internal wound during the pro-
of cicatrisation.

e ultimate success of the operation must depend on the permanency of
result, and at present it is impossible to express any positive opinion on
point until we have ascertained by pathological investigation what the
se nature of the cicatricial connective tissue may be. Up to the present
I have performed this operation for stricture in the penile portion only.
change of position may require a change of practice. In the sub-pubic
ion of the urethra we often meet with old strictures which are dense in
cture and resist dilatation. Forcible dilatation and incision employed
uch cases might readily give rise to local or general accidents of a very
re nature; and hence subcutaneous division of the contracted tissues
uld probably be preferred as less liable to be followed by the evil conse-
nces just mentioned.—*Lancet, Aug.* 28, 1875, *p.* 304.

59.—ON STRICTURE OF THE URETHRA.

By Dr. RAWDON MACNAMARA, Surgeon to the Meath Hospital, &c., Dublin.

In the vast majority of the cases of stricture which I have been called on to treat, I have been enabled to trace the origin of the disease to long-continued gonorrhœal discharge, and, so far as my experience goes, I have been able to acquit the use of injections, when properly prescribed, of any share in bringing about the existing condition of the urethra. So impressed is my mind with the truth of this conviction, that I never hesitate to employ appropriate injections in the treatment of gonorrhœa, and I have never yet seen any, even the slightest symptoms of stricture, resulting in such cases, where the disease has proved amenable to treatment in any reasonable period of time, and were such now my object, I would be in a position to record a great number of such cases which have been successfully so treated by me, in a space of time in which no other plan of treatment could have removed the disease. Of course, in making this statement I by no means wish myself to be understood as ignoring the possibility of the superinduction of stricture by the use of highly catheretic injections—the same cause will produce the same effect here as elsewhere; but I simply wish to observe that hitherto I have not been able to ascribe the supervention of stricture to the influence of injections judiciously prescribed.

In addition to the influence exercised by long-continued gonorrhœal discharges, I may observe that it has been my lot to see three cases in which the patients (adults) experienced most serious difficulty in micturition consequent upon stricture unconnected with any gonorrhœal history; in these cases the stricture was not situated in any portion of the urethra, but in a most unusual site, and one not generally described as the seat of stricture in systematic works on the subject: I allude to the prepuce, the opening of which was so contracted as scarcely to permit the passage of a bristle; in these cases the contraction was not of cicatricial origin, but was congenital, and required for its relief the operation of circumcision. In the museum of the Meath Hospital we have a pathological specimen strikingly illustrative of this condition. It has also been my lot to see several cases of stricture of traumatic origin—cases by the way always of a very troublesome and intractable character ; and in a very few cases the patients have persistently denied any possible cause for their disease, insisting upon it that their stricture was congenital, and asserting that from the earliest period of their life they suffered from difficulty in passing water; but putting these to one side I repeat that the vast majority of cases of stricture which have come under my observation owed their origin to long-continued gonorrhœal discharges.

I have met with cases of stricture, few to be sure in number, which were not benefited by the "immediate plan." Notable amongst these is that form of stricture which may be described as the resilient, or elastic stricture. In such of these cases in which I have employed the "immediate plan" the result has been unsatisfactory. The patient, to be sure, has not been in any wise injured by the operation, but his symptoms, even if temporarily ameliorated, have surely reappeared; but then the same remark applies to every other plan suggested for the treatment of this, in my opinion, the most intractable form of stricture.

Confining my testimony as to its results to that class of cases in which I consider the employment of the "immediate plan" as being judicious, and (excluding from consideration the resilient and catheretic stricture) I can assert that a considerable number of my patients have derived permanent relief from this mode of procedure. That all have been equally fortunate is not the fact. Relapses have occurred in my practice, some of these attributable to the imprudence of the patient, some to his carelessness, some no doubt due to the tendency of the urethra, once the seat of stricture, to recontract, no matter how treated.

Mr. Bernard Holt's instrument is that which I have principally used. It is *simple in construction,* efficient in use, and with ordinary care leaves but little

to be desired. Mr. Richardson's instrument is also a most admirable one, and once safely lodged in the bladder, I cannot conceive how even the veriest blunderer can go astray with it. Both of these are metallic instruments, and occasionally difficulty will be experienced in introducing into the bladder an inflexible instrument, where, on the contrary, a flexible instrument will be passed with facility. In such cases Mr. Smyly's modification of Mr. Holt's instrument will be found of very great value. This latter instrument has frequently been of signal service to me. It would be altogether foreign to the scope of these remarks to enter upon a description of these several instruments; but I do feel that a few suggestions equally common to them all may not be out of place. In the observations I am about to make I take it for granted that the reader is already familiar with the construction of the instruments of which I am speaking, and that he will bear in mind that they consist of essentially two portions—the instrument properly so-called and its dilator. Well, then, having satisfied himself that the instrument is safely passed through the stricture and lodged in the bladder, the operator is to divaricate its blades by the rapid introduction of the dilator; but in carrying out this apparently simple manœuvre, it is most important to observe the direction in which the force is applied—it is not to be from before backwards, but rather from below upwards. A good rule to follow is to permit the instrument, after it has been introduced into the bladder, to gain its own position, and then steadily to retain it in that position whilst introducing the dilator. After the dilator has traversed the extent of the instrument the operator is to pause for a few minutes, and then withdraw instrument and dilator together, *not* having first withdrawn the dilator and then the instrument. For the surgeon to introduce into the bladder any one of these varieties of instruments it is necessary that the stricture should be patulous to the extent at least of permitting the passage of a No. 2 (Weiss's gauge) catheter; where such is not the case it must be dilated to that extent upon ordinary principles. After the surgeon has withdrawn the instrument he should introduce a No. 10 or 12 (Weiss's gauge) silver catheter, and empty his patient's bladder of any water which it may contain. By so doing two important objects are gained—first, a few hours' rest is secured for the urethra, inasmuch as that period of time will elapse before the patient will require to make water again; second, the patient's mind will be satisfied by the introduction of an instrument of such size that his stricture has been effectually disposed of. The surgeon also may rest assured of it that there is less chance of a full-sized silver catheter becoming entangled in the laceration in the urethra than there would be in the case of a small-sized instrument. I would also recommend the surgeon to secure the presence of some urine in his patient's bladder at the time of the operation, as experience has taught me that thereby the carrying out of the several steps of the operation is much facilitated. I generally allow a day to intervene after the operation before I try again to introduce any instrument, and I am not disappointed if I fail in introducing as large an instrument as I had succeeded in passing after the operation, knowing well that in a day or two my efforts will be more successful, and that I will be able to pass even a larger instrument than I had done immediately after the operation.

Where the stricture is absolutely impassable, even by the smallest-sized instrument, brings me to the consideration of the last of the queries with which I have commenced these remarks.

In practice the surgeon meets with two varieties of stricture, in both of which at the time his best-directed efforts will fail in enabling him to pass through the stricture even the very smallest-sized instrument. But these differ from each other in the following very important particular: that in one the patient is able to pass water, in no matter how small a stream; in the other he cannot void a drop, no matter how strenuous be his efforts. I need scarcely point out how far more serious and distressing the latter condition is than the former. The first of these two conditions I have been for some years past in the habit of describing as the "impassable," the latter as the "impermeable," *stricture.* I am well aware how arbitrary may seem the dis-

tinction which I seek to make between these two words ; but the distinction answers my purpose, and I take advantage of it. How readily the impassable stricture is made impermeable is but too well known to both surgeons and patients, both of whom, though from a different cause, are perhaps equally distressed at the occurrence. The young and inexperienced surgeon will meet with few cases that will cause him equal anxiety to one of impermeable stricture; the sufferings of the patient, and his own futile efforts to relieve them, all conduce to his embarrassment, and tend to render the management of the case more difficult. Probably the poor sufferer had previously applied, but in vain, in other quarters for relief, and he now presents himself carrying about his person sanguineous evidence of persevering but ineffectual efforts made to reach his bladder. Many such cases have come under my notice; and whenever I find that previous abortive efforts had been made to pass an instrument, I never commence the treatment by trying to pass an instrument, but proceed as follows : I administer to the patient at once in a tablespoonful of water fifteen minims of a mixture composed of one part of the liquor morphiæ hydrochloratis (B.P.) and two parts of the tinctura ferri perchloridi (B.P.), and this I repeat every ten minutes until I succeed in my further efforts. As soon as I can I have him placed in a warm bath, the temperature of which, at first 98° of Fahrenheit's thermometer, is raised to 100°; and when he has been in this bath about fifteen minutes or so, by which time he will probably have taken his third or fourth dose of the mixture, I in the gentlest manner possible steal into his bladder a soft No. 2 (Weiss's gauge) gum elastic catheter, and once it has reached the bladder I take good care to leave it there until the following day. I know that, as a Professor of Materia Medica, I should be ashamed of the combination I have just suggested; but from repeated experience I also know its practical value. Proceeding after this fashion, I have never yet failed to relieve my patient, and it is a remarkable fact for a surgeon to a large metropolitan hospital to have to state, but nevertheless still a fact, that I have never yet seen the bladder tapped but on one occasion, and then I myself performed the operation. The case was a remarkable one: a very old blind man, who had lost penis and scrotum from the ravages of epithelioma, and in whom the most persevering efforts failed to discover the opening into the remains of the urethra. My distinguished friend and colleague, Mr. Porter, saw the case with me, and was equally unsuccessful with myself in his efforts to find the opening into the urethral canal. So far as to the treatment of the impermeable stricture. I shall now pass on to the consideration of the impassable form, where the patient is still able to pass water, but in a materially diminished stream, in some instances it escaping from him but *guttatim*. In the first instance I take bearings, passing down as far as I can, but in the gentlest manner, a large-sized instrument, and on its passage being arrested, I learn the site of the stricture—an important item of information, and one that generally will enable the experienced surgeon to predicate with tolerable accuracy whether he will have more than one stricture to cope with. Having learned so much, I now take a much smaller instrument, and upon failing to pass it, I have recourse to the smallest size in my armamentarium, and if, after repeated but most gentle efforts, I fail in introducing it, I desist for that day, making my patient take for fifteen or twenty minutes a warm bath, and ordering for him an anodyne draught to be taken on going to bed. Here I would wish to pause for a moment to dwell upon the importance of extreme gentleness in the management of such cases. Nothing is to be gained by force. The instrument should, as it were, be coaxed, not driven, through the stricture. When dwelling on the importance of gentleness in our efforts to pass an instrument, Civiale says that it should be "swallowed" by the urethra, in using which expression he unwittingly foreshadowed that which I have since demonstrated—that the vermicular action of the urethra is towards, not from, the bladder. Should the slightest appearance of blood present itself I invariably desist for that day from my efforts to pass an instrument. Next day, if circumstances permit of it, I see my patient in bed, and I proceed as follows: I pass down to the stricture a fine catgut bougie, and when its course is

arrested I commence to rotate it, always in that direction which will not unravel the gut, and after doing so some five or six times, I pull gently, very gently on the catgut, and if it has wormed its way, be it ever so short a distance, into the stricture, it will give a sensation to the operator's hand of being gripped —held fast—by the stricture, a sensation which, when once experienced by the surgeon, can never afterwards be mistaken. Having felt this, I recommence the rotation of the catgut, and if the stricture be a short one, I worm its way on into the bladder, where I leave it for a few hours, and then withdraw it, again ordering my patient, as before, the warm bath and anodyne draught. The surgeon who employs this plan of treatment for the first time, on proceeding to withdraw the catgut, will be surprised at the amount of force he will have to use to overcome the tenacity of the grip with which the stricture holds the catgut, the latter having swollen considerably whilst lying in the moist warm urethra. After a few days of such treatment I experience no difficulty in introducing a small-sized catheter into the bladder, which I frequently leave in for a night, and thus the urethra will be sufficiently enlarged to admit of any form of instrument the surgeon may wish to employ for the purpose of completing the treatment on the "immediate plan." Of course, the time occupied in thus treating a stricture will depend materially on the length of the stricture which has to be traversed. I have had some cases where at least two inches of the urethra were involved in the disease; these were of traumatic origin; but in time I was fortunate enough to be able to "tunnel" my way through them, and eventually to effect a satisfactory cure. Occasionally the stricture is so irritable that on the slightest provocation it will bleed, and the case will not tolerate even the gentlest effort to introduce the catgut. Here I have derived valuable assistance from the employment of the wax bougie. This is a kind of instrument, however, that requires far more gentle, cautious manipulation than any other, for upon the slightest pressure it will bend and break, turning upon itself; but, employed with care, it is capable of doing us good service. In one of my cases in which I was dilating the stricture by means of the catgut bougie, on withdrawing it there was pretty smart hemorrhage; but I was able to control it by passing down to the seat of the stricture a large-sized gum elastic catheter, and keeping it firmly pressed there for some time. The bleeding ceased, and the gentleman subsequently made a most satisfactory recovery. After using the catgut bougie two or three times it becomes so rough as to be unsuited for further use; however, by drawing it four or five times through fine glass paper it will become as smooth as ever—a hint for which the surgeon who uses many of these instruments in his practice will probably feel grateful.

I have already stated that I have hitherto hesitated to employ the "immediate plan" in those cases where I had reason to believe that a considerable length of the urethra was involved in the stricture, and promised to indicate the plan I pursue in the treatment of such cases. If able to pass a gum elastic catheter, of no matter what size, I tie it in, and let the patient sleep with it in his bladder. Next morning I experience no difficulty in introducing a larger sized instrument, which in a night or two afterwards, as circumstances indicate, is tied in, and so on until the urethra is fully dilated. If unable to succeed in the introduction of the catheter, I have recourse to the catgut or wax bougie, and proceed as I have already described. Of course, all this takes time, and is open to many sources of interruption, but by pursuing this course of "tunnelling and docking," I have been most fortunate in conducting my cases to a satisfactory termination.—*Medical Press and Circular, Sept.* 29, 1875, *p.* 249.

60.—ON THE HYDROSTATICS OF THE CATHETER, AND A PROPOSED MODIFICATION OF ITS FORM.

By Dr. Robert Somerville, Galashiels.

A common experience occurred to me lately. I had occasion to draw off the urine of an old man, the subject of paralysis. The catheter had to be used twice a day. The passage of the instrument was easy enough, but owing to loss of power in the muscular coat of the bladder, the emptying of the viscus was a tedious and disagreeable thing. There was a gush of urine when the catheter entered, but the greater part of the urine was only to be voided by compression of the hypogastric region.

Why this should have been, it is not difficult to see. The patient lay on his back,—the usual position when the catheter is passed. Immediately on the introduction of the instrument, while the bladder was distended, it was quite possible to depress the outer end of the catheter to a level very little if at all higher than the level of its inner end inside the bladder; and it required very little pressure indeed to send the urine through what was, as far as mechanical force is concerned, a level tube. This small amount of pressure the elasticity of the distended organ was able to furnish. But after a certain amount of urine had passed out, one could not, without undue violence, keep the end of the instrument so much depressed, and the urine had several inches to ascend before it could make its exit from the catheter. The paralyzed bladder could not of itself drive the urine up to the height required, and unless forced out by the pressure of the hand on the belly, it ceased to flow. This state of things is not confined to paralytic patients, but there is more or less of it in almost every case of catheterism of the male bladder, when during the operation the man lies on his back; the fact being that in this position more effort is required on the part of the bladder than can reasonably be expected, even of the healthy organ.

When a column of water is of small diameter, we are apt to neglect the pressure it exercises. But it makes no difference whatever, whether the diameter of a column of fluid be great or small. Pressure depends solely on the height of the column, and the small quantity of urine in the catheter offers as much resistance to the contracting force of the bladder as if the instrument, instead of being only one eighth of an inch in diameter, were a whole inch, or twelve inches even. A catheter of ordinary size and shape, when in the bladder of a patient lying on his back, frequently has its external end from four to six inches above the level of the urine in the bladder, the urine in the instrument thereby exercising on the inner surface of the bladder the pressure of a perpendicular column six inches in height. What does this pressure amount to? In calculating it, we may disregard, as insignificant, the difference of the specific gravities of urine and pure water. A column of water, then, thirty feet high exerts a pressure equal to the pressure of the atmosphere, or fifteen pounds to the square inch. A column six inches high, being a sixtieth part of this, will exert one sixtieth part of the pressure, or a quarter of a pound to the square inch. A column four inches in height will give a pressure of 2⅔ ounces. Hence it follows that the urine in the catheter must exert a pressure on every square inch of the bladder's internal surface of from 2⅔ ounces to 4 ounces; and it is evident that if the bladder is to empty itself through the catheter, it must more than balance the pressure of the column. So that, to send the urine through the catheter when the external end is from four to six inches above the level of the urine in the bladder, every square inch of the bladder's wall must press on its contents with a force greater than that of 2⅔ to 4 ounces. What wonder that, even with the help got from the abdominal muscles, a healthy bladder is scarcely equal to this, and an enfeebled organ quite incapable of it?

That, in the circumstances referred to, the entire force required to be exercised by the bladder is enormous, can be easily shown. Let us suppose that it contains 20 ounces of urine. This would occupy the bulk of somewhat over 34 cubic inches. The bladder is ovoid in shape, and has therefore a larger surface than if it were perfectly spherical. But a sphere, contain-

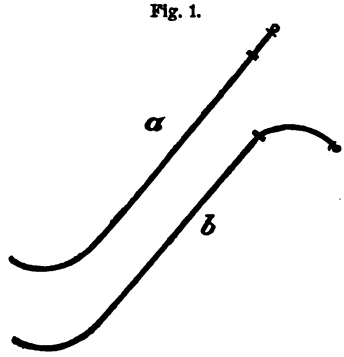
ing 84 cubic inches, has a diameter of rather more than four lineal inches, and a superficies therefore of upwards of 50 square inches. When the bladder then contains 20 ounces of urine, in order to overcome by its own contractility this pressure of a four-inch column of fluid in the catheter, it would require to exert a force of more than fifty times 2¼ ounces, or more than eight pounds. If the column were six inches in height, the force required would be more than twelve pounds. It may be objected to this estimate that, as a fact, we do not require, even in the case of the paralytic, to press on the hypogastrium with anything like this force. It is true. But the reason is that the structures behind and surrounding the bladder resist our pressure—exert, in fact, a counter-pressure on those portions of the bladder with which they are in contact, and enable us to effect our purpose with certainly not more than one half of the force we have calculated as necessary, if the bladder were to empty itself by its own contractility. In reference to this, however, it ought to be observed that a pressure of six or eight pounds is effected by the hand with far less effort than would be imagined by any one who has not deliberately experimented with the balance.

The mechanical disadvantage to the bladder, of having to raise the urine four or six inches above its own level, is easily illustrated when the female bladder is being emptied with a flexible catheter. The urine runs freely enough if the nozzle of the catheter be kept down, but the stream is at once arrested if the end of the instrument be raised a few inches.

Is there any method by which, in catheterizing the male bladder, the pressure of the column of urine in the instrument could be done away with? There is. By using a very long flexible catheter, and bending down the outer half of it, so as to make the urine leave the instrument at as low a level as it enters it within the bladder, we balance the column which is obstructing the evacuation with one which facilitates it, and the only thing required of the bladder in this case is to overcome the friction of the urine against the interior of the tube. By bending down the end of the catheter still further, we convert it into a syphon, the long leg of which is external, and, the descending column of urine more than balancing the ascending one, the urine, having once begun to flow, is bound to go on running, until the bladder is entirely empty. The urine no longer requires to be pressed out, it is drawn out.

But flexible catheters are not passed with the same readiness as silver ones, and they are in many respects inconvenient. It would be desirable to have the ordinary metallic catheter used as the short leg of the syphon. This I have succeeded in arranging, by the very simple method of putting on a flexible tube to the extremity of a silver catheter, ending with a curve, instead of the straight abrupt extremity that the catheters at present in use have. I have had a catheter of this sort constructed for me by Mr. Gardner, of Edinburgh, and, after seeing it, I am much surprised that instruments of this form have not come into ordinary use long ere this. Apart altogether from its capability of forming part of a syphon, when used alone without a flexible tube, the urine flows from it into the receiving vessel so much more conveniently than from catheters of the ordinary shape, that I should now be sorry to return to the latter, which almost invariably soil the bed-clothes of the patient and the hands of the surgeon. All that is necessary to convert this form of catheter into a syphon, is to slip on to it the end of an indiarubber tube. Such a tube as is attached to a ball-pessary answers well. The tube must be considerably longer than the catheter, in order that it may form the long leg, and the *catheter the short leg, of the syphon*. When, therefore, the catheter with

Fig. 1.



In Fig 1, the ordinary form of catheter is represented by *a*, that ending in the curve by *b*.

the tube thus attached to it is introduced into the bladder distended with urine, and the external end of the catheter is bent down towards the patient's bed, the first gush of urine fills both catheter and indiarubber tube, and flows out at the extremity of the latter. We may now allow the catheter to assume the position that the elasticity of the patient's tissues, uninterfered with, assigns to it. The external end of the catheter will spring up, yet the urine will continue to flow; for the syphon having once commenced to act, the emptying of the bladder will go on until the whole of what it contains is drawn off. Since the longer the descending column of fluid is, the more satisfactorily does the syphon work, I have found it of advantage to carry the tube below the thigh of the patient, and allow the urine to run into a vessel standing at the side of, and at a lower level than, the bed.

Fig. 2.

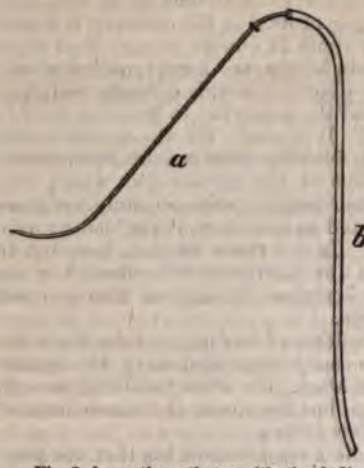


Fig. 2 shows the catheter with the indiarubber tube attached: the catheter *a* being the short leg, and the tube *b* being the long leg of the syphon.

For syphoning the bladder, however, it is not necessary to have a catheter specially constructed. In my first experiments, the bend of the syphon was formed by a curved metallic tube slipped on to an ordinary catheter. It worked well enough, provided the junction between the catheter and the tube were air-tight, this being absolutely necessary to the syphon arrangement. A very little cotton wadding wrapped round the end of the catheter before the tube was slipped on to it, effected this.

This whole matter of the pressure of the urine in the catheter when once looked at, is so simple and obvious that one cannot but have misgivings as to the necessity of asking the attention of the profession to it. On the other hand, its very simplicity may have caused it to be overlooked, and the advantages of the proposed method of using the catheter appear to me to be considerable. They are:—

First, Its convenience and cleanliness. We only need to see that the urine begins to flow. After this the syphon is self-acting; and provided that the inner end of the instrument remains in the bladder, as long as there is any urine to come, it will be drawn out. And then not a drop of urine need be spilt. These things are important in cases where the catheter requires to be habitually employed.

Secondly, It completely empties the bladder. Even when the bladder has not lost its tone, with the patient on his back, it is difficult to draw off the urine completely with the ordinary form of catheter; and when the muscular coat of the organ is paralyzed, it is almost impossible. Yet it is of great consequence to take away the whole of the urine, when it is alkaline and prone to decomposition.

Thirdly, It reduces the irritation of the mucous membrane by the catheter to the least possible degree. Every one knows the evil effects that in many cases follow the repeated introduction of the catheter. The rubbing of the end of the instrument against the internal surface of the bladder must be serious indeed, when the latter is driven by external manipulation against the unyielding metal, with the force that we have seen to be necessary to raise the urine to the outer end of the ordinary catheter. By doing away with the necessity of external pressure we save the patient from this source of injury.

Fourthly, It avoids entirely the temptation one often has, when the urine has ceased to flow, to raise the patient into an erect or semi-erect position,—a proceeding never devoid of danger with a metallic catheter in the bladder.—*Edinburgh Medical Journal*, Aug. 1875, p. 127.

AFFECTIONS OF THE SKIN.

61.—ON GOUTY AFFECTIONS OF THE SKIN, AND OF THE DIGESTIVE AND VASCULAR SYSTEMS; AND ON THE TREATMENT OF GOUT IN SURGERY.

By Sir James Paget, Bart., D.C.L., LL.D., F.R.S., Consulting Surgeon to St. Bartholomew's Hospital.

Sir James Paget, in the early part of the lecture, pointed out the relations existing between gout and various forms of diseases of the skin, such as psoriasis, eczema, urticaria, prurigo, pruritus, &c. These relations were not to be found in any anatomical feature, or in any peculiarity of appearance: an eczema or a psoriasis in a gouty person could not generally be distinguished by its own characters from one that occurred in a patient who had no gout. It was in connection with the treatment of these cases that the diathesis was important. It was as necessary, or rather much more necessary, to consider the person's constitution than the specific characters of his local disease. In following this rule, we must look to all the circumstances and antecedents of the case. For example, if eczema were found in a patient who had already had gout in its regular form, there must be a strong suspicion that the eruption depended on gout, and it must be treated in this view: such treatment was as much called for here as it would be in a case of inflammation of a joint in one who was known to be gouty; and the same must be held for psoriasis, or any of the forms of prurigo. If they were met with in those who presented some of the minor signs of gout that had been described in former lectures, or even if they were seen in the elder members of families in which gout was very prevalent, it must be carefully considered whether they were not dependent on the same constitutional defect, whether they were not incomplete gout appearing in the skin, just as, in another man, it might appear in the bronchial tubes, or in the proper texture of the lungs, or in the joints. One character which these affections of the skin evinced in common with other gouty diseases, was the sudden manner in which they were often developed: thus they might occur suddenly in the night, without any previously suspected cause, unless it were some indigestion or some unusual diet of the day. This peculiarity was well marked in the more acute cases of gouty eczema, and gouty psoriasis of the skin. And some help in diagnosis could be gained from the observation that they were uniformly made worse by those articles of food that were notoriously bad for complete gout—fermenting drinks, beer, champagne, hard food, salt, &c. However, this was a point on which too great reliance was not to be placed, for nearly all skin-diseases, both acute and chronic, were made worse by the kinds of food just mentioned. There was a short rule that used to be given in the out-patients' room, and it certainly was a good one. The patients were told to have nothing salt, strong, sour, or sweet. It might seem that such a rule shut patients out from all the comforts of life in respect to diet: it was meant, however, merely as a rule against the excessive or too ample quantities of strong drinks, acids, salt, and sugar, which many persons habitually used in their diet. But the main point to be insisted upon was that, in the study of all affections of the skin occurring in elderly persons, the question whether the disease was associated with a gouty constitution should be looked to; for if this were forgotten, treatment would be very likely to fail. Here a caution was given against a danger that might arise out of the present method pursued in the nomenclature of skin-diseases. Their classification had grown very minute of late, and it was founded mainly on an anatomical basis. There was nothing in it that could afford any indication of the constitutional condition with which the various forms of disease were associated; and there was certainly some likelihood that this important side of the question might be overlooked. Among other cases of skin-disease in *relation to gout, were ulcers of* the integuments, which followed collections

of urate of soda in the form of chalk-stone. Where these collections occurred, repeated attacks of inflammation in the skin over them ensued, and then an ulcer formed, weeping out continually a thin ichorous pus, with chalky matter. These ulcers, which were very troublesome to manage, might be treated with water-dressing, or with solution of soda, until the deposit was removed, and then, to promote their healing, with solution of nitrate of silver painted over their surface.

Another form of skin-disease often seen, especially in old men, was an eczematous ulcer about the ankle. There were a number of persons who suffered from eczematous ulcers, as they might be called—that is, they had eczema, some portion of which became the seat of a thin, shallow layer of ulceration. This condition was frequently intolerably painful, especially when the patient lay down, or while he was in bed. Patients constantly complained that when they were in the warmth and quietude of the bed, the pain became an agony. Nearly all such ulcers were gouty. In many persons the ulcer was associated with a varicose state of the veins; not, it was to be observed, with the large tortuous blue veins that are commonly termed varicose, but with large clusters of the smaller veins, collected about the ankle or some part of the leg. These clusters were not all blue, but some were as bright as if they contained arterial blood. It was often said that the ulcers in these cases depended upon varicose veins, and even that the varicose veins were the source of the eczema. That view, however, was a fallacy. Many of those who had varicose veins never had any symptom of eczema. Both the eczema and its superficial ulceration depended on incomplete gout, and the presence of the varicose veins was merely a coincidence.

Some gouty affections of the digestive organs were next referred to. There were many persons who could tell almost certainly by the state of their tongue that they were about to be attacked with gout. It was not meant that there was any one condition of the tongue that was met with in all patients alike; but that many men learnt by experience that, when they found their tongue coated in a particular way, it indicated the coming of gout. Each man knew his own tongue in this sense. All he had been able to observe in these cases was, that a thin white fur was coated thinly over the whole tongue; yet some patients could tell by it, and tell truly, that their gout was at hand. There was one disease of the tongue, however, that was found associated with gout, viz., psoriasis: a condition in which the mucous membrane became smeared all over with a thickish opaque white covering, which some had compared with a layer of mucus left behind by a snail tracking its way over wood. This condition of psoriasis might be very frequently seen in the syphilitic patients in the hospital, and it was very difficult, by the characters of the disease itself, to discriminate between the syphilitic psoriasis of the tongue and the gouty; but it might be taken that, in the great majority of cases, the disease depended on one or other of these constitutional conditions; there seemed to be exceedingly few cases but the syphilitic and the gouty in which psoriasis of the tongue occurred.

Then, again, respecting certain diseases of the pharynx and soft palate in elderly persons. An elongated uvula was in old people, he would not say always characteristic of gout, but it was very suggestive of it. There were few except gouty persons who habitually had at or after middle age an elongated uvula. In nearly all signs would be found, either of the well marked complete gout or the minor forms which had been spoken of. And there was a condition of what might be called pharyngitis, which was often associated with this, when the whole of the mucous membrane of the pharynx passed into a condition very like that of the elongated uvula, looking clogged, heavy, œdematous, and, as it were, slow to move, and covered with an unusually thick glossy epithelium. The pharynx, it was remarked in passing, was a part to be carefully studied for the indications it afforded of constitutional disease. Thus there was a condition of the pharynx which was almost always an evidence of tuberculosis, in which it was covered with granular prominent glands. Again, scrofulous disease was often found here. Dr. *Brinton* had described what he regarded as a gouty form of dysphagia, and *he was so good* an observer, that it was not likely he was mistaken; but he

(Sir James Paget) could not say that he had been able to recognise the condition in any cases he had seen.

As to gouty dyspepsia, little need be said in the course of a surgical lecture; but it might be remarked that dyspepsia was more common in the gouty than in almost any other class of patients, such as the tuberculous, the scrofulous, the anæmic, the nervous. And there were some features always prominently marked in the dyspepsia of the gouty. These persons suffered especially with acidity and flatulence, and they were patients with whom many articles of diet habitually disagreed, making them, as they vaguely expressed it, "bilious," or giving them headaches. These offending articles of diet also frequently brought out some of the minor signs of gout with great rapidity. Many persons, if they took beer, or champagne, or any drink which was incompletely fermented, were almost certain to find, on waking next morning, that their knuckles were stiff and painful, or that they had burning palms or soles, or some neuralgia about the scalp. This development of certain symptoms after the use of certain articles of diet was, indeed, so uniform, that it afforded a valuable test of the existence of the gouty constitution, just as the speedy effect of mercury or iodide of potassium indicated the presence of syphilis, or that of quinine the presence of ague. These were not, he thought, indifferent or minor facts; they were really among the things that must be often used in practice.

The lecturer then passed on to refer to gout as affecting the vascular system. It had been held by some observers that atheromatous disease of the arteries was mainly due to the gouty constitution. There were, however, many grounds for doubting this; and probably all that could be said was that, as severe or long-continued gout induced extensive degenerative changes in almost all the textures of the body, the arteries were affected in common with the rest. Certainly aneurism was less frequent in the gouty than in the syphilitic, and senile gangrene was not more prevalent among elderly gouty persons than among other classes of patients at the same age. Gouty disease of the veins—gouty phlebitis—however, was undoubtedly a very common affection. It was by far the most frequent form in which anything that could be called idiopathic phlebitis occurred. It was perhaps one of the most frequent of the irregular forms of gout; and any case of phlebitis occurring without an apparent cause in an elderly person might be suspected to be of this nature, particularly if the attack were very sudden.

This closed the list of the minor signs and forms of gout that Sir James Paget mentioned; but he remarked that his aim had not been to refer to all that could be collected, but rather to select such specimens as might direct the attention of his hearers to the subject, and induce them to study it carefully for themselves. Then, as to the treatment of gout as it was seen in surgery: at the first glance, it might appear that the treatment of gout could be summed up in a few sentences; certain rules were always good; certain medicines were always useful. But it must be remembered that gout was an affection that mixed itself with whatever other constitutional defect was present in the patient it attacked; and thus not only were there modified forms of gout, but there must be, to meet these, modified forms of treatment. Of course, the treatment of a gouty man who was also scrofulous must be different from that required for one who was syphilitic, or nervous, or healthy besides his gout. Then, again, the gout needed very different treatment according to its intensity. There was no doubt that colchicum had a remarkable influence upon all cases of complete gout; and it might probably be taken as a rule that the more complete the form of gout was, the more it affected the joints, and held to those without shifting to other textures, the more marked would be the benefit that would result from colchicum. Given in appropriate doses at right times, it undoubtedly materially shortened an attack of complete gout in any joint, especially in or about the foot. Colchicum had a comparatively small range of utility in incomplete gout, or in the irregular form that had been mentioned as usual in surgical practice; for instance, the utility of colchicum in acute gouty eczema was very limited, and the same may be said of it in acute gouty phlebitis. It should be noted that in *those who were scrofulous* or tuberculous, and at the same time gouty, *colchicum must be given, in* order that its depressing influence might be

avoided, in small doses, and with quinine, or iron, or some other tonic. What had been said of colchicum, might be said also of another medicine that was esteemed as specific. Veratrum, commonly given as veratria, had a definite influence upon complete gout; it was to be doubted whether it had any effect at all on incomplete gout.

As to diuretics, diaphoretics, and purgatives, these were often useful; but this, probably not because they had any direct influence on the gout itself, but because they corrected some coincident defect of health; they promoted excretion, which was frequently very imperfect in gouty persons.

There were three things chiefly which had to be considered for all gouty persons. First, the drinking of a certain extra quantity of water, there was no doubt, was essential for the maintenance of health in many of these patients. An excellent plan was to drink water in the early morning. Many gouty persons were able to diminish, or even get rid of their minor symptoms of gout, by drinking half a pint of water while they were dressing in the morning, and before they had taken any solid food. Those who found an excess of lithic acid or of lithates in their urine should take some alkaline water instead of plain water, and they should drink enough to render the urine clear and free from deposit. Many of the German alkaline waters, such as the Carlsbad and the Vichy, were very useful; or those that were purgative as well as alkaline might be employed when the bowels are confined. Secondly, as to baths and thorough washing: in gouty persons, as a rule, the skin acted inefficiently, and therefore all gouty persons—in common, indeed, with all others—should use a bath every day. It was, however, doubtful whether cold water should be used by those who were elderly. If there were a tendency to neuralgia, or to any of the more painful forms of rheumatic troubles of the joints, or lumbago, or even general feebleness of the circulation, tepid water should be used. And, in order to secure a thorough cleansing of the skin, mere cold or mere warm water was not enough; the greasy material that collected on the surface must be washed away with soap and good rubbing and frictions. Persons who were fat and whose skins were hairy might have a Turkish bath, but thorough daily washing with warm water and soap was all that could be required. And, in connection with the bath, was a matter that was too seldom attended to in England, though it was productive of much benefit in the various health-resorts in Germany,—the custom of going to bed for an hour or two directly after the bath had been taken. In Germany, the patient, after taking some slight amount of food to avoid faintness, had his bath, and then went to bed for some time. Probably, under these circumstances, quite as much good was done in bed as in the bath; while the body was covered and completely at rest, and the nervous system tranquillised, the skin acted freely. If our English baths were used with the same care in this respect as is taken in those abroad, we should work much better cures with them. Thirdly, as to diet: gouty folks should be very moderate in all their food—not, however, too abstemious, for these patients were seldom really vigorous, or able to dispense with a nutritious diet. But moderation should be observed, particularly in respect to the use of stimulants; and each patient must select for himself, or be advised to take what suited him best. There was a prevalent opinion that spirits were better than wine; but he doubted whether this was really true. The chief point was, that whatever stimulant was taken should be used in the most strict moderation.—*British Medical Journal*, *June* 5, 1875, *p.* 737.

62.—A NEW METHOD OF PERFORMING PLASTIC OPERATIONS.

By Dr. J. R. Wolfe, Surgeon to the Glasgow Ophthalmic Institution.

It is now nearly three hundred years since Tagliacozzi published his great *work on Plastic Operations*; and, notwithstanding the admiration which the *work of the Bologna* professor had elicited, it is remarkable how comparа-

tle has since been done for the cultivation of plastic surgery. The are obvious. The fact is that, in operations of the nose, eyelids, and e most interesting regions for improving deformities—Tagliacozzi's of taking flaps from the arm has been generally abandoned, on ac- the extreme discomfort which it involves; and the practice of tak- from the forehead or face having been the only one in vogue, the re came to be considered more serious. In addition, when we take ount the elements of failure, from shrinking of the flap, from erysipe- ngrene, it is not to be wondered at that surgeons are generally chary ting to the expedient, except in great emergencies. It amounts to e are to cut the skin off the face to repair the face; and, in doing so, great risk of failure. To render plastic operations on the face more ble, and to bring them within a wider scope of utility, the following ms must be fulfilled. 1. We must take a flap from the arm, or from er part but the face. 2. We must seek to eliminate the elements of

I propose, in this short communication, to indicate the means of g both these conditions.

Tagliacozzi laid down the rule, which has ever since been consider- e primary law, and *sine qua non* to the success of the operation, that must retain its connection to the adjacent living structure by a pedi- ch is to be severed only after complete union and cicatrisation of the faces. This pedicle has, in my opinion, been a source of great em- ent to surgeons, and tended rather to retard the progress of plastic . From my observations on transplantation of structures from the nimals and on skin-grafting, as well as on plastic operations, I have ld it demonstrated, that in most cases the pedicle is not essential, if it do contribute anything, to the vitality of the flap. This being once hed, we are henceforward free to choose our bit of skin from any part body we may find suitable.

ext endeavour has been to eliminate the elements of failure. The al cause of failure I find to be in the subcutaneous structures. If we kin-flap to adhere to a new surface by first intention or agglutination, t be sure that it is cleared of all areolar tissue, and properly fixed in place. The following case will illustrate the points referred to.

sation of the Lower Eyelid with Skin from the Forearm.—P. C., aged arrier, was admitted into the Glasgow Ophthalmic Institution, with , eyes and eyelids injured by an explosion of powder. I showed the man y to the Edinburgh Meeting of the Association, as an instance of con- al transplantation from the rabbit. The right upper eyelid, which rongly everted, I partially succeeded in correcting by skin-grafting. wer right eyelid being completely everted, its integument totally de- l, and the skin of the face consisting of discoloured cicatrices not by eans suitable for plastic operations, I formed a new lower eyelid in the ing manner. The edges of the upper and lower eyelids having been d, I introduced three ligatures into the border of the lower eyelid, which sted to my assistant. By means of these ligatures, he used traction, I dissected the whole of the cicatricial tissue, and thus liberated the ant structure. The ligatures were then introduced into the upper eye- d the edges of the upper and lower eyelids were thus united. I then ed the edges of the wound, preparing them to receive the new flap like ch-glass. The skin required for the formation of this eyelid was two s in length and one inch in breadth, which I took from the forearm. t the principles above indicated, I divided my flap into three portions. irst I removed, along with the cellular tissue, as close to the dermis as tible with the integrity of the flap. The other two portions, after re- g them from the forearm, I turned up; and with a cataract-knife, I l off the areolar tissue, leaving a white surface, which I applied to the d. The difference between these flaps was very remarkable. The two which were previously prepared, healed by agglutination, without ting even the slightest tendency to desquamation of the cuticle. ty-four hours after the operation, the surfaces looked pale; but the day the *temperature was normal*, and appearance healthy; whilst that

part which was applied without previous preparation looked rather livid the first day, improved the next two days; the fourth day it began slightly to suppurate; and, after a hard struggle for life, a portion of it only remained, while the rest shrank. This, however, will not compromise the result of the operation, which may be considered satisfactory.

The dressing consisted of gutta-percha tissue applied next to the skin, a graduated lint-compress, and a bandage to maintain immobility of both eyes. The union was so rapid and so perfect, that I separated the upper from the lower eyelid on the fourth day.—*British Medical Journal*, *Sept.* 18, 1875, *p.* 360.

63.—TREATMENT OF PORRIGO, TINEA FAVOSA, ETC.

By Dr. Henry Maccormac.

[The results of treatment for parasitic cutaneous diseases are often disappointing, but Dr. Maccormac has found much more satisfactory results from petroleum than from any remedy previously tried.]

The first thing I do, the scalp being concerned, is to clip or, where it can be done, or as far as it can be done, shave the hair closely off, and keep it so. In cases that have been neglected, it will be desirable to premise a few simple poultices, bread or linseed meal. I direct the petroleum to be applied twice daily, by inunction, in the form of one part petroleum to two of lard and a few drops of oil of lavender or, say from half a pint to a pint of petroleum in a pound of lard, with twenty drops of oil of lavender. The vessel or jar which contains these, may be stood in a basin of boiling water, occasionally renewed, stirring with a wooden spatula until the whole is intimately blended.

This unguent is to be applied, gently but thoroughly, once or if it be practicable, twice daily. A soft brush is a very good implement to use, and the ointment when about to be applied, may be moderately warmed beforehand by standing the cup or gallipot, which contains it, in hot water. Judgment must be used in apportioning the strength of the ointment and the amount of the application to the state of the parts and the irritability of the subject. After the application a piece of dry soft clean linen rag may be laid on—an old cambric handkerchief answers very well—and over all, a soft clean linen cap.

Before the next application of the petroleum ointment, the head must be thoroughly but gently washed with black or fish soap and fresh warm soft water. The ointment is then to be reapplied as before. Every rag or cap, once used and past further use, should be thrown into the fire, but if intended for further use, plunged in a hot soda lye, and after being well washed, finally rinsed in water containing a little carbolic acid.

The last instance of porrigo which I had to deal with, was in a cutler's daughter. Her case was rather a distressing one, with many sores, the hair had mostly disappeared, and there were vermin as well. The very first application proved advantageous, and the patient did well in every respect, except as to regaining her hair, afterward. The family have removed, and I cannot speak of the young woman's present state, but I have no reason to doubt but that it is satisfactory.

In a recent case of trichophyton tonsurans in a youth of eighteen, a large patch of hair, producing great disfigurement, was absent. I must here observe that I had begun with pencilling a weak alcoholic solution of corrosive sublimate over the parts. I then had recourse to the petroleum ointment and black soap. The case, after some continuance of treatment, has done extremely well. A vigorous growth of hair now covers the previously denuded surface. A preceding case of trychophyton occurred in a pretty *young Jewess.* A naked patch rather larger than a crown piece, subsisted at *the very vertex.* The young lady has since married, and the vertex, when I

saw her last, bears no trace of having ever been wanting in respect of its hairy covering.

I wish to add that the petroleum ointment with black soap, is an excellent remedy in itch, removing it with ease and safety. It is a capital remedy for lice, destroying them on the pubis, in the axilla, or on the head. In two or three instances where these hideous vermin had extended over the whole surface, the petroleum ointment with black soap and the warm bath, employed twice daily, removed them with magical celerity. In insane persons, whereon vermin often house, petroleum ointment and soap proves most useful. So far as I have had an opportunity of trying it, I find the petroleum alike serviceable in the mange of dogs, swine, and horses, destroying the minute parasites along with the cutaneous affections which they engender.—*Practitioner*, *Oct.* 1875, *p.* 261.

64.—ON THE HYPODERMIC TREATMENT OF INDOLENT ENLARGEMENTS OF THE CERVICAL GLANDS.

By Dr. Morell Mackenzie, Physician to the Hospital for Diseases of the Throat, London.

Indolent glandular enlargements should be either cured radically or left altogether untreated. Half-measures only give rise to disappointment and cause disfigurement. An enlarged gland may be a slight blemish, but when it has been blistered, poulticed, painted with iodine, incised, or subjected to any of the various modes of treatment recommended in such cases, it often becomes a deformity.

As a rule, parents and young ladies are very desirous to get rid of these glandular swellings, not only on account of the disfigurement which they occasion, but because they are regarded as blots on the family escutcheon. It becomes important, under these circumstances, not only to disperse the tumours, but to leave behind as slight traces of their previous existence as possible. For the last eighteen months I have been engaged in trying various remedies, hypodermically, with a view of curing indolent glandular swellings. I have tried solutions of pepsine with and without dilute hydrochloric acid, dilute hydrochloric acid alone, dilute acetic acid, tincture of iodine, alcohol, solution of nitrate of silver, solution of chloride of zinc, and several other remedies.

In carrying out hypodermic treatment the cure may be effected either by resolution or by destruction. In the former case absorption takes place; in the latter the injection is followed sooner or later by suppuration. It is desirable, if possible, to cure by resolution. I have found acetic acid, as recommended by Dr. Broadbent for the treatment of certain kinds of cancer, the most useful remedy for this purpose. With this agent I have treated twenty-seven cases; of these fifteen were completely cured by resolution, four were greatly benefited, in five suppuration took place, and three patients discontinued treatment without any decided effect having been produced. I have used the ordinary dilute acetic acid of the British Pharmacopœia, and have generally injected from five to twenty drops, according to the size of the gland to be treated, seven or eight drops being an average dose. The injection should not be made more than once a week. The fluid should be injected well into the middle of the gland. Suppuration has generally resulted from the solution having been injected either too frequently or too superficially. If suppuration take place, the fluid should be drawn off with a hypodermic syringe or aspirator. The average duration of treatment by resolution is three months.

For treatment by destruction and suppuration, a solution of nitrate of silver answers best. The solution should be of the strength of one drachm to the ounce, and not more than three to five drops to be used. Considerable interstitial destruction is *generally* produced after three or four injections, *sometimes after a single injection.* When pus forms, it should be drawn off

as already directed. Treatment by destruction, if successful, is rather more rapid than that by resolution, but induration of the outer portion of the gland sometimes follows the treatment, and interferes with its success. I have treated five cases in this way; in three of them the cure was complete, in two incomplete. The treatment by pepsine and dilute hydrochloric acid was rapid, but was twice followed by superficial sloughs of the skin, and for that reason I abandoned it.—*Medical Times and Gazette, May* 29, 1875, *p.* 577.

65.—A NEW MODE OF TREATING CERTAIN TUMOURS OF THE LYMPHATIC GLANDS.

By S. Messenger Bradley, Esq., Manchester.

At the recent Edinburgh meeting of the British Medical Association a paper of mine was read in which I advocated the subcutaneous injection of iodine in certain cases of lymphatic tumours, and as I have since then employed this method in several fresh cases I have thought that a brief account of the mode of procedure might prove interesting. It must be premised that I do not speak of lymphatic tumours generally, but of certain kinds only; thus I do not refer to syphilitic or carcinomatous affections, or to the infectious or soft form of lymphomata, but confine my attention to three groups. First, true hypertrophies of the lymphatic glands, with or without a strumous diathesis; second, strumous hypertrophies—*i.e.*, cases of cellular hyperplasia *plus* caseous deposit; and, third, hard non-infectious lymphomata which present many points of resemblance to the first groups, and, indeed, are often only distinguishable in being multiple.

Now, there is perhaps nothing more common than to paint iodine over all the above-mentioned tumours unless it be the disappointment which results. This, at least, is my experience, the result apparently being the same whether the iodine is painted indiscriminately over the whole gland or whether it is applied, according to Furneaux Jordan's advice, over the contiguous lymphatics rather than over the gland itself; and yet all that seems to stand between this treatment and success is the thin skin which intervenes between the gland and the pigment.

The first case in which I injected iodine into a tumour did not appear very promising, though it proved perfectly successful. It was an encapsulated tumour, about the size of a large walnut, situated beneath the lower jaw, which I should have removed with a scalpel, had I not once had some unpleasant hemorrhage in a precisely similar case; and as the patient in the present instance lived at some distance, I resolved to try to procure absorption before resorting to extirpation. *The tumour almost disappeared with the first injection*, and after one more it could not be at all detected. I was pleased with the result, because it appeared to me to be so desirable to adopt such a plan at one's consulting-rooms, and in the out-patient room of the hospital, instead of using the knife, which is always more or less terrible to the patient, and which is sometimes, in the most careful hands, followed by unfortunate results. Since the case I mention I have been in almost the daily habit of employing iodine in this manner, and I think I may venture to affirm that, by properly selecting cases, a successful result may be assured, while there is no doubt that an indiscriminate use of the remedy will be productive of disappointment. The best cases are those where a single cervical gland is hypertrophied in an otherwise healthy (adult) subject. Five or six injections of the simple tincture of iodine (five to ten minims at a time, according to the size of the tumour), at intervals of about four days, generally effect a cure. The earlier stages of strumous hypertrophies are also very successfully treated by this method, as are the small hard multiple lymphomata; *but in the later stages of* strumous disease of the cervical glands, where the *tumour is broken down* into a mass of caseous matter, and the neighbouring

f blue and undermined, no good results follow from the injection of ; and, indeed, these cases are best treated by a careful excision of the ised and degenerated glands. I have also recently employed iodine ins in a large and hard fibroid bronchocele, which had been treated essfully by the internal administration of the drug. The tumour was ly inconvenient from its size, but had almost destroyed the voice, and so l on the trachea as to deflect it to the right side of the neck. The i still under treatment, but the first two injections of ten minims of were followed by the diminution of an inch in the girth of the neck. ity of reasoning we may expect this method to prove serviceable in) myomata and allied growths, but it is to its value as a remedial agent s of lymphatic enlargement of the cervical glands that I especially) call attention, and I may briefly summarise my results on this head ibular statement:—

Cases of cervical tumours to be treated by injection of iodine.

a. True hypertrophies of the lymphatic glands without strumous admixture.
b. Strumous hypertrophies before breaking down.
c. Hard lymphomata.
d. Encapsulated cervical tumours, as a tentative operation.

Cases of cervical tumours to be treated by incision.

a. Strumous glands which have broken down into pus, with or without previous treatment by injection.

Cases of cervical tumours to be treated by excision.

a. Strumous glands infiltrated with caseous matter, which may be rocked to and fro upon a base of degenerated cellular tissue, with a margin of blue undermined integument.
b. Encapsulated tumours which have resisted the treatment by injection.—*Lancet, Sept.* 4, 1875, *p.* 341.

AFFECTIONS OF THE EYE AND EAR.

ON SOME PRINCIPLES OF OPHTHALMIC THERAPEUTICS.

By R. Brudenell Carter, Esq., Ophthalmic Surgeon to St. George's Hospital.

e influence exerted upon the eye by ordinary facial neuralgia is well n, and has of late been more carefully studied than at any former time. arly every instance of acute pain of the first division of the fifth, we find mation and conjunctival hyperæmia of the affected side, and also in- ed tension of the globe, which, if the pain recur frequently, is apt to be lished as a permanent condition. This fact was first brought into pro- ace by Wegner, in the year 1866; and my own experience has assured f the general accuracy of his observations. Nearly every case of glauco- hich I have seen in a comparatively young subject has had a history of tedent neuralgia, not merely of ocular pain due to the increasing tension l, but of paroxysmal pain in the whole region of the first division of the ; and nearly every patient who is subject to periodic facial neuralgia is ious of, or will discover on observation, a marked clouding of vision on affected side during the attack. I think, moreover, that the converse hold good, and that, as a very general rule, anæsthesia of the fifth is as- ted with abnormal tension of the eyeball.

is, therefore, not too much to affirm that we are familiar with grave of ocular nutrition, as ordinary results of remote nerve lesion, which lf be situated either at the peripheral extremity of a nerve of the ; or on the *ganglion of the* nerve of the affected eye, or on the sen-

sory trunk on the hither side of this ganglion, or at the unknown and presumably central seat of paroxysmal neuralgia. There is nothing improbable in the belief that this kind of influence is exerted more frequently than has hitherto been supposed; and clinical experience has long ago forced upon me the conviction that such is the case. I constantly see eye-disease, which cannot be referred to any known or definite local or constitutional cause, in which the pain or other nervous symptoms are in excess of the local lesions, and which resist the treatment that at first sight seems calculated to be successful. In such cases, especially when they occur in persons who have a neurotic family or individual history, or who have been subjected to severe emotional or intellectual strain, I am accustomed to assume the existence of some remote nervous change, and to bring this hypothesis to the test of therapeutics. If I then succeed in curing the patient, I regard the truth of the hypothesis as being well-nigh proven. Take, for example, the various superficial corneal and conjunctival eruptions and ulcerations which were collectively described as "strumous ophthalmia" by old writers. We observe, in many of these cases, an element of extreme nervous irritation, manifested as photophobia, which varies greatly in degree in different patients, and even in the same patient at different times, and which stands in no apparent relation to the quantity or character of the local tissue changes. More important still, we find a certain number of these cases which resist all the methods of treatment that are commonly successful, but which yield almost immediately to the administration of arsenic—a medicine which acts upon many forms of neurosis with nearly as much certainty as quinine upon ague, and which almost establishes the general character and analogies of any malady that it cures. For an admirable sketch of the value of arsenic, especially from this point of view, I would refer to an introductory lecture by Dr. Clifford Allbutt, which was published in the Lancet in October, 1871.

Besides arsenic, the medicines which may be used to confirm a neurotic diagnosis in ophthalmic cases are mainly quinine, iron, bromide, and iodide of potassium, and morphia. The influence of quinine and iron upon neuralgia forms part of the common stock of medical knowledge; but I think it is less widely known that these remedies are far more efficacious in combination than when given singly; that they are far more efficacious in small and frequently-repeated doses than in larger ones separated by longer intervals, even though the same absolute amount may be taken; and that the certainty and celerity of their action may be much increased by the addition of a small quantity of morphia. I am indebted to my friend Mr. Gregory of Stroud for the knowledge that a pill containing a grain of quinine, two grains of potassio-tartrate of iron, and from a twelfth to a twenty-fourth of a grain of morphia, according to circumstances, and taken every hour until an expected paroxysm has been missed, will often cure periodic neuralgia with a rapidity and certainty not to be attained by any other method of administering the same medicines. I have also found this formula to be of the greatest possible value in many cases of eye-disease, in which local changes were progressing too rapidly to be overtaken by the use of a grain or two of quinine twice or thrice a day as a "tonic," but in which they were promptly arrested when the patient was brought under the influence of the specified combination.

The action of bromide of potassium upon the central nervous system, and probably upon the blood-supply of that system, is too well established, by its effect upon epilepsy and upon sleeplessness, to need any further remark than that some prescribers still give the salt in inefficient doses, taking ten grains as their average standard rather than twenty or thirty. But the iodide of potassium, on account of its great value in some of the later forms of syphilis, and on account of the large proportion of eye-disease which may be traced to a syphilitic origin, holds a somewhat less assured position as an anti-neurotic. Many practitioners believe that the beneficial influence of the iodide, in any given case, almost establishes its syphilitic character; but in this opinion I am unable to concur. I think that iodide of potassium has a far wider range of usefulness than in syphilitic *cases only*; that, like the bromide, it has a manifest influence upon the *blood-supply of the* brain, and that it cures maladies, such as recurrent, noc-

turnal headache, which cannot be traced to a syphilitic origin, or described as syphilitic except by an abuse of language. Like the bromide, the iodide is frequently given in doses which are well-nigh useless; an error which perhaps arises from the circumstance that some patients are extremely susceptible to the action of the medicine. If we habitually order ten grains three times a day as a commencing dose, we shall find, in nearly all the cases in which the iodide is useful, that this dose may be rapidly increased to double or treble the quantity, or even beyond these limits. In some cases, doubtless, we shall find that the iodide does no good; and in a few we shall find that it is useful, but at the cost of coryza and other troublesome symptoms. I am indebted to Mr. Hutchinson for the practical knowledge that, when the iodide is at the same time clearly indicated and badly borne, it is almost always possible, by reducing the dose, to obtain its advantages without the attendant evils. The patients concerned are persons who are abnormally sensitive to the medicine, but they are abnormally sensitive alike to its remedial and to its poisonous action. For them, therefore, we may possibly find that two grains, or one grain, or even half a grain, will do as much as ten grains for the majority of people; and when we are told that a certain patient cannot take the iodide, or find by experience that he cannot take it in ten-grain doses without inconvenience, we should not on either ground abandon its administration, but should simply diminish the dose until we arrive at one that can be borne, and should then continue this until we see whether beneficial effects are likely to be produced by its employment. The principle of action is to begin with ten-grain doses, to increase them by five grains or so at a time, if they are clearly useful, whenever there is any arrest in the progress of improvement, and only to diminish them in the few instances in which coryza or other indications of iodism are produced. That a few people are abnormally sensitive to the action of a medicine is a circumstance which does not justify us in giving this medicine to the many in an inefficient manner. When iodide of potassium is really wanted, the administration of five grains twice a day, or of three grains three times a day, is little better than allowing the disease to run its course unchecked.

The larger doses, it must be remembered, require some circumspection in the time and manner of administration. They are best combined with four or five grains of carbonate of ammonia, and freely diluted. I am accustomed to direct the dose to be taken about an hour before a meal, and to be immediately preceded by half a tumblerful of barley-water, which will insure the necessary dilution with a bland fluid.

With regard to the use of morphia, or of other anodynes which may be better adapted to individual cases, it may be accepted as a sound general principle that no eye will get better while it is acutely painful; so that acute pain must always either subside or be subdued as a condition antecedent to recovery. Perhaps we might also say that a morbid state which is either originated or maintained by remote nervous irritation is not likely to improve in the absence of refreshing sleep. Premising that pain may be due to physical conditions—*e.g.* to increased tension of the globe, to the pressure of a displaced lens upon the iris, to the protrusion of iris through a wound, or to the presence of a foreign body—and that in all such cases the necessary mechanical treatment must be first applied, and may prove to be all that is needed, we may say that the object of using anodynes is to subdue pain and to procure sleep; that for these purposes they must be given, if necessary, in repeated doses at regular intervals; and that they must be measured less by quantity than by their effects. It is seldom necessary or desirable to give anodynes for the moderate amount of pain which usually follows an operation, and which may be expected to subside in an hour or two; nor must we expect to render a diseased or injured eye free from sensations of discomfort. Such sensations are inseparable from abnormal conditions when the nerves themselves are healthy; and in feeble persons there is no less favourable symptom after a cataract operation than a total absence of pain or discomfort. Such an absence usually points to a torpor of the nerves, *which is itself incompatible* with speedy healing, and is a com-
mon precursor of an unsuccessful issue. But severe or long-continued pain

indicates, and assists to maintain, a state of nervous irritation which is at least equally incompatible with repair, and which it is always necessary to subdue. Whenever acute or abiding pain is present in eye disease, we have a reason for the addition of anodynes to any other treatment which is required, and this addition should be made in an effectual manner, by giving to the patient or nurse the means of repeating the dose, if necessary, at stated intervals, until the desired effect has been obtained. It will not do to be content with administering a dose of morphia hypodermically in the evening, or with prescribing a pill to be taken at bedtime. Provision should be made for the continued administration, say of a quarter of the original quantity, hour by hour, until pain is subdued or sleep produced. There are certain forms of iritis in which the acuteness of pain is a very prominent symptom ; and it was chiefly in cases of this class that the late Mr. Zachariah Laurence succeeded, some years ago, in bringing about a cure by the use of large doses of opium or morphia alone. He kept his patients in a state of semi-narcotism for several days, or until all symptoms of acute inflammation had subsided. His original paper in the Edinburgh Medical Journal is still interesting; but it was written at a time when the importance of preventing adhesion of any part of the margin of the pupil was not sufficiently understood; and it is probable (the point not being mentioned) that many of his cases, although dismissed from treatment as cured, were left with synechiæ which could hardly fail to excite recurrent attacks of inflammation.

Ophthalmic Diseases of Constitutional Origin.—If we consider the ophthalmic affections which are of constitutional origin, we are necessarily confronted in the first place by syphilis, the most far-reaching and the most widely-diffused morbid poison of which we have any knowledge. We shall scarcely see a single case of eye-disease, as distinguished from defects of shape or of function, in which we shall not have to weigh the question, "Is this syphilitic ?" and the number of instances will be very large in which the balance of probability will incline to an affirmative reply. If we include all its known forms, syphilis attacks every important structure of the eye directly —the cornea, the iris, the retina, the choroid, and the vitreous, being all the common seats of distinctly syphilitic affections. It also attacks the eye indirectly, as when syphilitic paralysis of the third nerve produces ptosis, or when syphilitic paralysis of the fourth or sixth produces double vision, or when syphilitic paralysis of the fifth nerve produces (as we have seen) corneal opacity or ulceration, or when syphilitic tumours in the brain produce the changes which have been miscalled optic neuritis, with the attendant liability to consecutive atrophy and blindness. The question of the diagnosis of syphilis is one upon which it is not necessary here to dwell, further than to say that, from various social and domestic reasons, and on account of certain obivous temptations to untruthfulness, it is often beset with great difficulty, while, at the same time, it may be absolutely necessary for the surgeon to arrive at some definite conclusion with regard to it. The occurrence of iritis in one eye of a previously healthy young woman, soon after her marriage to a man who is very likely to have contracted syphilis, but who denies having done so, is perhaps as good an example as can be found of the practical bearing of an oftentimes insoluble problem. In such a case, it is generally a simple matter to cure the iritis, whatever may be its nature ; and supposing it not to be syphilitic, there will be an end of the difficulty. But if it should be syphilitic, the patient, when her iritis is cured, will only have completed the first link in a long chain of morbid action, likely to entail suffering, and perhaps premature death, upon herself, and to be continued to the next generation in her children. From such a fate she may be rescued if the surgeon can say that the affection of the eye is an expression of a constitutional malady, and can induce her to submit to the treatment necessary for its cure. When certainty is not attainable, high probability must be accepted as a guide, and it is better to be content with high probability than to enter upon inquiries which may be productive of domestic unhappiness; always remembering, however, that the patient should have the benefit of a doubt in this sense,—*that to overlook natural syphilis is, in practice, perhaps the most serious of all errors,* while to suspect it when it is not there, and to act upon

the suspicion discreetly, is an error indeed, but one which may relatively be described as trivial. The nature of the case renders it incumbent upon every practitioner to cultivate, in the highest possible degree, the faculty of recognising the external signs of syphilis, so that he may be able to form a diagnosis independently of history. It is not sufficient to know that syphilitic eruptions usually leave copper-coloured stains; but all the effects of the disease should be studied with the sort of care which was bestowed upon symptoms by the physicians of an earlier day, before the multiplication of instruments of diagnosis had produced our own comparative independence of the art of personal observation. Whoever, in dealing with declared syphilis, leaves nothing unnoticed, will often come upon the track of the undeclared as an Indian recovers a trail in the wilderness, by signs which cannot mislead, but which are too slight to engage the attention of less cultivated faculties.

The worst manifestations of ocular syphilis which have fallen under my own notice have occurred in patients in whom the primary disease had been recognised, but who had been lulled into a false security after an inadequate period of treatment, which had inded removed local symptoms, but had left the constitutional malady untouched. A few years ago, more than at present, it was the custom for surgeons to begin the management of syphilis well, and to stop prematurely in the midst of their well-doing. A man contracted a chancre, and his inguinal glands became indurated. He was treated with mercury for perhaps six weeks, or until the chancre had healed and some trivial secondary eruption had appeared and faded, and then he was allowed to lay aside the medicine. He was told that he might or might not have further secondary symptoms ; and that, if they appeared, it would be sufficient to treat them with iodide of potassium. The great debt of gratitude which the world owes to Ricord has been materially enhanced by his long life, which has enabled him to witness the end of things, to watch over his patients from their adolescence to their old age; and to see, in many cases, the manhood of two generations of their descendants. From the evidence gathered during an experience which is nearly as unparalleled in its duration as in it sextent, he tells us that syphilis is radically and permanently curable, but that it cannot be cured, as a rule, otherwise than by a course of mercury continued, with due intermissions and precautions, for something like twelve months. Less than this will, indeed, in most cases, leave the patient apparently well, but the disease will again declare itself at some future time, and often in some of the obscure forms the nature of which we have only just learnt to recognise.

In 1857, a young gentleman, reading in London for his army examination, contracted a venereal sore, and wrote to me for advice about it. I was then living in the country, and I told him to go to an eminent hospital surgeon, and to pay implicit obedience to his directions. The sore was pronounced to be a hard chancre, and mercury was given in the way to which I have just referred. After a few weeks it was discontinued, and patient and doctor were both satisfied. The former obtained his commission, and went to India with his regiment. He was a keen sportsman, and after snipe-shooting in some marshes was attacked by what was called rheumatism, and was sent to England. Here he recovered and went to Aldershot on duty; but was again attacked, and was sent away from the camp to his father's house, where he had been lying in bed for a month when I was asked to see him. Many of his joints were swollen and tender, and he was quite helpless. I told his medical attendant of the chancre, and we agreed to lay aside all other treatment in favour of iodide of potassium. In a week our patient was riding about on horseback, and he soon returned to duty. A year or two later his syphilis showed itself again, this time by occlusion of a cerebral artery and consequent hemiplegia; so that this gentleman, not twenty-five years of age, was crippled and disabled for life. Such a history is common enough; but any individual practitioner usually sees only a part of it, and the part which chiefly falls under my observation is the cropping up of syphilitic disease of the retina or choroid, or of brain tumours producing secondary mischief in the eye. Quite lately a gentleman came to me with loss of central *vision in one eye*; and the ophthalmoscope showed a patch of

disease over the region of the macula lutea. I expressed a belief that it was syphilitic, and inquired his history. Three years previously he had contracted a chancre, and had been treated for it in Ireland, by an eminent surgeon now deceased. At my request he wrote to the druggist who prepared his medicine, and obtained copies of the prescriptions, with the dates at which they were made and repeated. It appeared that he had been under mercurial inunction for a fortnight, and that then he had taken small doses of the perchloride for four weeks, making six weeks of mercury in all; and this was the result. Analogous cases present themselves every day to those who will take the trouble of tracing out a chain of antecedents.

The instances in which we are led by iritis to the discovery of an early stage of syphilis present no difficulty with regard to treatment, except such as may arise from the incredulity or the circumstances of the patient. We have but to cure the iritis in the ordinary way, and to apply to the syphilis the principles which Ricord has so clearly stated. If the patient will not take mercury for the necessary time, so much the worse for him; and if he is forewarned of the probable consequences, the surgeon is relieved of all responsibility. That the mercury should be cautiously given, and in such a way as to avoid the production of its poisonous effects, is a matter of common sense on which it is unnecessary here to dwell.

When the period of primary syphilis has long passed away, and when mercury has been given for a few weeks, as in the cases above cited, it is much more difficult to decide upon the course to be pursued. We have, then, two remedies between which to choose, mercury and iodide of potassium. Of these, iodide of potassium is the more rapid in its influence upon the symptoms actually present, but it probably possesses little or no power to modify the systemic malady. Nothing in clinical history is more remarkable than the rapid amelioration of the symptoms of late forms of syphilis under the use of the iodide; nothing is more certain, generally speaking, than their recurrence in the same or in some modified form. Mercury, on the other hand, will be slower in producing its first action, but more effectual as against the syphilitic taint; although it is not proven that syphilis of long standing can be cured by mercury, at least with anything like the same certainty as the earlier stages of the disease. It is in the eye, however, that the immediately curative effects of mercury are most remarkable; and it is from its visible action upon iritic effusions that many inferences have been drawn with regard to its supposed kindred action in parts of the body that are concealed from view—as, for instance, in the pleura. I am indebted to my lamented friend the late Dr. Anstie for the suggestion that these inferences may possibly be in some degree erroneous. He believed that mercury had some special elective affinity for, or special action upon, the parts which are supplied by the fifth nerve, and did not admit that its manifest influence upon iritis is necessarily an evidence that it will exert a similar or equal influence elsewhere. In support of this view it may be said that the poisonous effect of mercury is displayed first upon the gums, which derive their nerve supply from the source indicated; and we may also find something analogous in the deposition of lead in the gums, coupled with its tendency to produce atrophy of the optic nerves. The suggestion is one upon which I need not dwell, but it will serve to call to mind the powerful effect of mercury upon the eye, as well as the possibility that the argument from the eye to other organs may be fallacious. Returning to the question immediately under consideration—the choice between mercury and iodide of potassium—it may, perhaps, be said that the best rule of practice is to inquire whether the local changes in actual progress are such as to inflict irreparable injury unless they are speedily arrested. If they are, iodide of potassium should be given in the first instance, and should be continued until a distinct impression is made upon the case; when it may be laid aside, and mercury given instead of it, with the hope of anticipating subsequent phases of mischief. If the changes in progress are not of this pressing character, it may often be best to give mercury from the first. A corneal ulcer threatening to spread or to perforate, so that in two or three days it might permanently impair the *eye as an organ of* vision, or an amount of effusion in the nerve disc likely to

speedy atrophy by its interference with the local circulation, would f them call for the most rapid influence that the iodide could afford. haziness of the cornea, or a turbidity of the vitreous body, or a limit- ant of the retinal or choroidal change, may be taken to illustrate ns in which it would be legitimate to wait for the more gradual ope- f mercury.

node of administering iodide of potassium has been already described; ncerning the administration of mercury, there is nothing to be said as any special application to the eye. The skill of modern pharma- has multiplied preparations; but by these I have not been tempted ke old and trusted friends. Sir Astley Cooper was wont to tell his that if they were much addicted to new remedies two results would bly follow: first, they would not cure their patients; secondly, they have no patients to cure. For the most part, I am accustomed to gain ledge of new remedies chiefly by reading or hearing the accounts given a by others; and I feel that the weapon which I have learnt to use is hich, in my own hands at least, is most likely to do good service. In o obtain a mercurial influence quickly, I use either blue pill, or inunc- th blue ointment, or both together; and, for prolonged administration, chloride. Inunction is often useful for adults, but its especial value he case of young infants suffering from a combination of the purulent lmia and inherited syphilis. For them, the plan I prefer is to smear day a little fresh ointment on a strip of flannel, about an inch and a ide, which is buttoned around the abdomen, next the skin, and worn ntly. Mr. Hutchinson is accustomed to have the ointment rubbed into les of the feet, the only part of an infant's skin on which it never pro- irritation. To this there are no other objections than the trouble of ting the hands of the rubber, and the ill-consequences which may fol- the protection should be incomplete. Together with the pill or the ion, except in the case of infants, it is wise to employ a little opium to griping or purgation; and the perchloride combines admirably with r quinine, or arsenic, or with any two of them, and is generally more ve in combination than alone. To this armamentarium I am beginning l a new remedy which is of sufficiently good repute to deserve a trial— y, Staub's chloro-albuminate for hypodermic injection; but I cannot eak of it from an experience large enough to form the foundation of an n. Calomel, with precautions and under conditions that will be de- d when discussing the diseases of the cornea, is often useful as a local ation; but, given internally, it has no advantage over blue pill, and lomel-vapour baths, so much extolled by my esteemed colleague, Mr. f Lee, have appeared to me to be somewhat uncertain in their operation, sometimes, to be too energetic. For these reasons they fail to fulfil I regard as essential to a good method of mercurial treatment—namely, the surgeon should hold the reins of it in his hand. We are much in- d to Mr. Haynes Walton for the force and clearness with which he has ed out the boundary between the remedial and the poisonous action of ury; and this boundary the prescriber should never transgress. Save in xceptional cases of idiosyncrasy, in which mercurial poisoning may be uced by a single moderate dose, there should be no such thing as a sore th resulting from treatment. The slightest line upon the gums indi- a point beyond which the medicine should not be pushed; and the est art of administering mercury is to keep the patient, as it were, on the k of this line, without permitting transgression of it. For this purpose, inexperienced practitioner must be content to feel his way; and the most rienced will constantly find that he can do little more.

he other forms of constitutional malady which entail proclivities to eye- ase are chiefly gout, rheumatism, albuminuria, and diabetes; and there tle to be said concerning them beyond the obvious caution that they t not be overlooked, and that the general treatment which any of them, r present, would require, must be combined with the local treatment h the affection *of the eye may* render necessary. Again, there are cer- *temporary states of system* which would materially affect both the

prognosis and the treatment of ocular disorders apparently identical in their nature. A hemorrhage in an eccentric portion of the retina, occurring in a woman whose whole circulation was deranged at the period of the menopause, would call for little more than the ordinary precautions of the time ; while a similar hemorrhage in a man of the same age would suggest extensive disorder of the arterial system, and would, in all probability, be the precursor of renal disease or of apoplexy. Hence it is always necessary to inquire, in any case of eye-disease, not only with regard to the presence or absence of what may be called the greater forms of dyscrasia, but also, generally, "What is there lying behind this local change ?" The inquiry becomes especially important in the case of patients who are passing from middle life towards old age, but there is no period at which it can be neglected with impunity. Appetite, diet, exercise, sleep, the tone of mind, the nature and amount of work, the character of the atmosphere habitually inhabited, and the balance between waste, repair, and supply, as shown by the state of the excretions, should all be systematically inquired into. A patient cannot make a speedy and satisfactory recovery if he is underfed or overfed, if he leads an unduly sedentary life in vitiated air, if his brain is overworked or harassed by emotions or anxiety, if his sleep is insufficient, or if his system is loaded with the waste which his excreting organs fail to remove. Neglect of these conditions is not an uncommon result of too early a devotion to specialism on the part of the practitioner; and, in its effect upon the patient, is a fruitful parent of chronicity and of relapse.

It must not be inferred from the foregoing observations that the local treatment of eye-disease is to be neglected, or that it is unworthy of the closest and most careful attention. On the contrary, whatever may be the background, so to speak, of remote or of constitutional causation, and however necessary it may be that this background should be modified by circumstances or removed by art, yet still, in all the maladies of the parts anterior to the crystalline lens—that is, of the iris, the cornea, or the conjunctiva—the character of the local treatment will usually determine the degree of exellence of the local recovery. An eye is likely to be spoiled, for visual purposes, by even a brief continuance of certain morbid processes ; and it is, therefore, the business of the surgeon to terminate these processes as rapidly as possible. Their gravity may be due solely to their situation ; and, just as a degree of inflammation which would be trivial in any other part of the mucous membrane may destroy life when it occurs in the larynx, so an ulceration, which would elsewhere be left to run its course, may destroy vision when it occurs upon the cornea. If a patient has a syphilitic ulcer of the leg, we need take little trouble about local applications, knowing that it will heal under the influence of rest and of anti-syphilitic internal medication. But if he has a syphilitic ulceration of the cornea, we must remember that the difference between judicious and injudicious local treatment will determine whether or not it shall extend or deepen for two or three days longer than it need; whether or not it shall perforate; whether it shall leave a mere temporary nebula, or a cicatrix disfiguring to the appearance and disturbing to the sight. In vascular inflammation of the cornea it will depend, in great measure, upon local treatment, whether or not the curvature of the membrane shall undergo injurious modification. In iritis it will depend upon local treatment whether or not the pupillary margin shall be left adherent to the lens. Lastly, in many cases of the more acute forms of conjunctivitis, it will depend upon local treatment whether or not the cornea shall escape injury, and whether the malady shall be cured in a reasonable time, or shall lapse into a stage of absolutely indefinite duration and of infinite possibilities of mischief. While, therefore, we must neither overlook nor neglect to treat the systemic conditions on which affections of the eye may more or less depend, we must not place reliance upon constitutional treatment only, to the neglect of the various local applications by which the local malady can be conducted to a safe and speedy termination. Of the two errors, the less serious would be to neglect the constitutional treatment, because this *neglect might often* be repaired on some future occasion ; while, on the *other hand, a corneal* ulcer suffered unduly to extend itself, or an iritis suf-

fered to establish firm adhesions, may easily produce consequences which would be altogether irreparable.

On some Principles of Local Treatment of Eye Diseases.—There are certain principles of local treatment, of very general applicability, which it will save repetition to state once for all in this preliminary essay. In the uncovered eye, the lids are constantly passing to and fro over its surface, so as to remove particles of dirt deposited from the atmosphere, and to diffuse the tears and conjunctival mucus evenly over the globe. In diseased conditions, when the conjunctiva and cornea are roughened by the projection of distended blood-vessels, and when the natural secretions are altered or diminished, and especially when there is any abrasion or loss of the corneal surface, the friction of the lids becomes not only painful, but injurious, and the movements are at the same time increased in energy and frequency by reflected irritation. It then becomes necessary that they should be restrained; and for this purpose we employ what is known as a "compressive bandage." This is composed of a small piece of fine linen to cover the lids, some carded cotton-wool for padding, and a roller, about an inch and a half wide and nearly two yards long, formed of any fine elastic material, but preferably either of what is called "water-dressing bandage" or of flannel gauze. The free end of the roller should be placed on the forehead, over the affected eye, and the first turn should be made across the forehead and round the head horizontally, so as to secure the end. When the roller reaches the forehead, over the sound eye, for the second time, it should be inclined downwards, carried under the lobe of the ear, round the occiput, under the lobe of the second ear, and then upwards across the face, over the affected eye, to the forehead. Before the roller is brought over the affected eye, the small piece of linen should be placed upon the closed lids, and all the hollows of the orbit should be filled and padded with the cotton-wool, in sufficient quantity to allow the roller to exert distinct but gentle and uniform pressure on the parts beneath. When the roller reaches the forehead, it should be secured to the horizontal turn with a pin, and then a second horizontal turn over all will complete the application. By varying the quantity of wool and the degree of tightness of the roller, any desired amount of pressure may be exerted by this bandage, which, if carefully applied, is very little liable to be displaced. Too much care cannot be taken in filling the orbital hollows, and in so distributing the wool that its pressure may be uniform, because if a bunch of wool were simply applied to the lids over the convexity of the globe, and then bound tightly on, the effects of such a proceeding might often be disastrous. For a patient who is able to walk out, and who objects to the white bandage as being unsightly, a tolerably efficient substitute may be made by a double piece of soft black silk six inches long and an inch and a half broad, neatly hemmed, turned into a point at each end, and having three-quarters of a yard of narrow soft black ribbon sewn to each point. The silk may be placed obliquely over the carded wool, with one point coming to the temple on the sound side, the other under the lobe of the ear on the affected side. The ribbons may then be brought to meet at the occiput, crossed there, brought horizontally round the head, and tied in front, or over one ear.

There are many circumstances under which it is desirable to apply cold or heat to the eye; the former to moderate, the latter (as in the case of sloughing ulcers of the cornea) to promote vascular action. For these purposes we employ compresses of various kinds. For cold, the compresses should be of fine linen, about two inches long by an inch and a half broad, smoothly and evenly folded, and composed of from four to six thicknesses of material. Half a dozen or so being prepared, they should be steeped in a basin of cold water, in which, if desirable, a lump of ice may be floating, and which should be placed close to the patient. The nurse takes out the first compress, squeezes it in her fingers just sufficiently to prevent water trickling from it when it is applied, and places it gently over the closed lids. In a time varying from one to five minutes, according to the heat of the part and the effect desired, the compress should be exchanged for a second, the first being replaced in the iced water. The object of having several in use at once *is that, by taking them in regular* rotation, each may have time to be-

come perfectly cold before it is reapplied. If the water be hard, and the skin of the eyelids delicate, it is well to apply a little olive or almond oil to the latter, to prevent superficial irritation.

For the application of heat the flat compress is less effectual than something lighter and more bulky; and for this purpose small sponges may be employed, wrung out of hot water in a similar manner. Von Graefe was accustomed to use hot camomile fomentations, and to apply them by means of little muslin bags, in which a few camomile flowers were sewn up prior to being boiled. Each bag, as it was taken from the eye, was returned to the decoction to recover its temperature; and it is obvious that, whether water or some medicated decoction is employed, it must be kept hot during the whole period of application, either by a spirit-lamp or some similar contrivance, or by additions of fresh hot liquid from time to time. As a rule, neither heat nor cold should be applied to the eyes continuously for any long period; and an hour, twice or thrice a day, will usually be enough for either. In the intervals the compressive bandage should be carefully adjusted.

The bandage, by excluding light and by preventing movement, affords a considerable degree of rest to the eye, and thus places it under conditions favourable to recovery. But, in order to obtain complete physiological rest, it is necessary to have recourse also to atropine, which paralyses for a time both the ciliary muscle and the sphincter of the pupil; and thus establishes absolute internal relaxation and passivity of the organ. Furthermore, on account of the close functional union and sympathy which exists between the eyes, it is necessary, whenever one is seriously affected, to enforce entire rest of its fellow—that is to say, to enjoin absence from reading, writing, or any other pursuit requiring visual application, as well as avoidance of exposure to dust, cold winds, heat, or glare.

The use of atropine for the purpose above mentioned is best accomplished by a solution in distilled water of the neutral sulphate, of the strength of two grains to the ounce. This solution, if the drug be pure and neutral, is absolutely unirritating to most eyes; and a drop may be placed in the lower conjunctival fold, near the outer canthus, two or three times a day. For the purpose of making the application, there is nothing better than a goose quill, cut to a blunt scoop; but, considering the highly poisonous nature of the solution, it is perhaps safest to send it out in special bottles, with a dropping apparatus attached. Various contrivances have been devised for this purpose; but the best of them is a little blown-glass bottle. By heating the bulb of this bottle slightly in the flame of a spirit-lamp, the contained air is caused to expand; and then, by inverting the bottle, and dipping its beak into the solution, a sufficient quantity will be driven through the capillary opening by atmospheric pressure. In use, it is only necessary to invert the bottle, to hold it in the warm hand, and to touch the lining of the lower eyelid with its beak, from which a drop will issue.

If the application of atropine should be painful, the most probable explanation is that the drug is impure or not neutral, or that sulphuric acid has been either set free by spontaneous changes or added by the dispenser to obtain a clear solution. In such case, no time should be lost in obtaining a fresh supply. But when atropine has been long in use, the best preparation is apt to cause local irritation in some persons, and this irritation is usually more manifest in the eyelids, and especially on the lower lid, and on the adjacent skin of the cheek, than elsewhere. It may be readily recognised by a peculiar stiffness and dryness of the inflamed skin; and the swelling of the eyelid is usually sufficient to remove the lower lachrymal punctum from contact with the globe, and thus to produce an overflow of tears. Under such circumstances, the atropine must be laid aside, and some soothing application made to the closed lids. The best is, I think, the compound ointment of subacetate of lead of the British Pharmacopœia, which may be applied to the skin freely, and a soft bread-and-water poultice laid over it. But it is a rule without exception that no preparation of lead should enter an eye when there is any loss of corneal epithelium; because we are then liable to *have an opaque* deposit of carbonate of lead formed upon the surface. If the *corneal surface should* be ulcerated or abraded, it is the safest practice not to

let lead come into use, even as an external application, for fear of mischance; and in such cases I prescribe for the atropine irritation a simple ointment, into which a little sedative solution of opium has been stirred—perhaps in the proportion of half a fluid drachm to an ounce of ointment. There are some persons, however, by whom no preparation of atropine or of belladonna can be borne even for a time; all of them alike producing an erysipelatous inflammation. Such instances are rare; but there are few writers on ophthalmic surgery who do not record one or more from personal experience, and I have myself met with two of them. It is unnecessary to say that such an idiosyncrasy places a most formidable obstacle in the way of treating iritis and various other affections.

In the case of children, and especially the children of the poor, who are often roughly handled by their parents, and who have not learnt to trust to them, the proper application of atropine is sometimes a matter of considerable difficulty; and the solution is very apt to be washed out, or at least diluted, by tears. At hospitals we constantly see children for whom atropine has been prescribed, but whose pupils are not dilated. Occasionally, perhaps, no one at home has taken any trouble about the matter; but more frequently, I believe, the drops have gone over the cheeks, or anywhere but into the eyes, or they have been applied so roughly as to produce plentiful crying. In hospital practice such children can be brought every day so that the application may be made effectually; and it will often be desirable to use, instead of the solution, the little wafers of atropinised gelatine which were devised by Mr. Streatfeild. I do not like these wafers for common use, because they often produce too much smarting; but for crying children they have a great advantage in the fact that they dissolve slowly, and that the medicament is not liable to be at once washed away by a gush of tears.—*St. George's Hospital Reports, vol.* vii., *p.* 98.

67.—REMARKS ON THE OPHTHALMOSCOPIC APPEARANCES MET WITH IN INTRACRANIAL DISEASE.

By C. Higgens, Esq., Assistant Ophthalmic Surgeon to Guy's Hospital, London.

Optic neuritis, and choked disc (*ischæmia*), are two conditions which are very frequently confounded; both are met with in association with intracranial disease, but differ from each other in some essential particulars, both objectively and in their subjective symptoms.

It is not intended for a moment to infer that optic neuritis and ischæmia are caused only by disease in the skull, as such is not the case; moreover, intracranial disease may occur without any change visible by the aid of the ophthalmoscope. But should optic neuritis or ischæmia be found affecting *both eyes simultaneously*, very strong evidence of lesion within the cranium is afforded, even though no subjective cerebral symptoms be present.

Let us now consider, first, what are the signs by which neuritis may be distinguished from "ischæmia" or choking of the disc; second, what are the cases in which each is likely to be met with, or rather, what form of intracranial disease should we expect to find associated with an inflamed or simply a *choked* condition of the optic discs.

The following are the principal ophthalmoscopic appearances by which neuritis may be distinguished from ischæmia:

Neuritis.	*Ischæmia.*
The disc is grey, opaque, and somewhat swollen.	The disc is red, resembling the surrounding choroid in colour, greatly swollen, projecting considerably into the vitreous chamber, its area being also increased; its transparency, however, is only slightly affected.

Neuritis.	*Ischæmia.*
The retina for some distance around the disc is swollen and infiltrated with grey and opaque inflammatory material.	The retina around the disc is only affected to a slight extent, and is not opaque, but simply œdematous and swollen.
The retina veins are enlarged and tortuous, the arteries being smaller than normal; the number of visible vessels is less than in health, and many of them are shrouded and concealed from view in parts of their course by the inflammatory exudation.	The retinal veins are enormously distended, and their visible number is increased; the arteries are small; none of the vessels are shrouded and concealed entirely from view in any part of their course, but portions of them may appear darker or lighter, according as they lie near the surface or deeply in the substance of the œdematous portion of retina. A bend will also be noticed in the vessels where they pass over the border of the swollen disc.

Both in neuritis and ischæmia hemorrhages may exist on the surface of the disc or in the surrounding retina.

The great subjective distinctive symptom is, that in neuritis vision is always much impaired, whilst in ischæmia little or no want of sight is complained of.

I am sometimes asked why it is that a patient apparently suffering from double optic neuritis complains of no defect of vision; my answer is that the case is not one of neuritis, but of ischæmia.

The cases of intracranial disease which come before me as an ophthalmic surgeon, have all more or less impairment of vision,—on account of which I am consulted. On examination I find either optic neuritis or its sequel, atrophy of the disc. But if I examine cases in the medical wards, I often find ischæmia in both discs in cases where there is no want of sight.

In order to account for the loss of vision in neuritis and its non-impairment in ischæmia, it is necessary to understand the morbid changes which take place in the optic nerves in each. In neuritis the inflammation usually commences in the intracranial portion of the nerve, extends along its trunk, and at length becomes manifest in its intraocular portion (the optic disc). On microscopic examination, the trunk of the nerve, the optic disc, and retina immediately surrounding it, will be found infiltrated with inflammatory material, which necessarily gives rise to more or less impairment of function.

Neuritis is caused by irritation of the nerve trunk, from direct pressure upon it, or more commonly from its implication in some inflammation of the structures next which it lies.

In "ischæmia" the trunk of the nerve is not affected, but only its intraocular portion. The condition arises simply from obstruction to the return of blood from the eyeball, causing venous hyperæmia, which once set up is liable to be increased by the pressure of the unyielding sclerotic ring, through which the optic nerve and blood-vessels pass.

As a consequence, the head of the optic nerve becomes *strangulated*, exudation of serum takes place from its vessels, and the condition known as ischæmia, or choked disc, is established. In other words, there is dropsy of the optic disb and immediately surrounding retina.

Now, the mere fact of the nerve fibres being somewhat compressed by the sclerotic ring, and soaked in fluid, is not sufficient to prevent the normal conduction of impressions formed on healthy portions of the retina, *e.g.*, on the yellow spot: consequently no impairment of vision need occur in simple ischæmia, although the ophthalmoscopic appearances are such as to attract the attention of the most casual and inexperienced observer. Secondary inflammatory or atrophic changes may follow upon ischæmia, and then vision becomes impaired. We now come to the second question.

Optic neuritis, as before stated, commences in the trunk of the nerve behind the eyeball, and is caused by direct irritation. I would therefore suggest *that, in cases where* the ophthalmoscope shows inflammation of the optic

some disease about the base of the brain or skull, such as meningitis, titis, or caries should be suspected.
hæmia depends upon and is a visible sign of obstruction to the return nous blood from the eyeball, and may be caused, I think, by any intra- al affection, tumour, &c., which gives rise to *overcrowding* of the con- of the skull, or possibly by any disease which causes permanent con- on of the head.—*Guy's Hospital Reports*, 1875, *p.* 315.

ON OBSTRUCTIONS OF THE LACHRYMAL SAC AND NASAL DUCT.

By W. Spencer Watson, Esq., Surgeon to the Great Northern Hospital, London.

considerable number of cases of obstruction of the lachrymal sac and al duct are due to temporary causes, mere congestion or œdema of the ous lining being the most common, but plugging with inspissated mu- being also an occasional cause of the obstruction. Such cases may often relieved by the simplest possible treatment, or get well spontaneously; if they have remained unrelieved or neglected they may pass into the dition of permanent obstructions, and these will almost always require atment by the use of instruments.
Permanent obstructions occur under a variety of circumstances—as, for in- ance, in congenital absence of the nasal duct, which is said to have oc- red in a case recorded in Forbes' "Review" (xii., 641), and in which M. rard succeeded in making a communication with the nose direct through lachrymal bone; or in the cases of bony deposit, whether from chronic ostitis, exostosis, or as the result of injury, as in the case recently brought fore the Society, in which an injury to the face had distorted the nasal nes and obstructed the passage of tears. It is better under these circum- nces to abandon all attempts at restoring the natural channel, and to ce a passage through the inner wall of the lachrymal sac and the os unguis. is has been effected with very excellent results. Some difficulty is experi- ced in such cases in keeping the new aperture patulous, but the daily pass- g of a probe, or the use of a soft silver or leaden style for some weeks will nerally succeed. The permanent strictures, whether of the sac or nasal ct, most commonly met with are the results of the acute inflammatory at- cks, known as lachrymal abscesses. The lining membrane of the sac and ct becomes thickened in the course perhaps of chronic catarrh, or by an ute congestion, the flow of tears is at once delayed, mucus accumulates, and e channel is completely obstructed. Inflammation of the sac follows, an scess forms and bursts on the cheek. Henceforth there is a permanent icture, and probably a fistulous opening on the cheek besides. Treatment the very early stage of threatening abscess may sometimes arrest its pro- ss; but the best prospect of success is derived from treatment of the cedent catarrh. Though, however, stricture of the lower part of the sac ts junction with the nasal duct is thus the result of abscess, it is proba- in many cases its exciting cause, the retention of secretions within the due to an obstruction being sufficient to excite acute inflammatory ac- .

have spoken before of the benefit sometimes obtainable by the use of in- ions into the sac when combined with constitutional treatment in simple porary obstructions; but if simple treatment is not speedily followed by ef, it is always better to resort to the use of the probe, and as a prelimi- y to slit open the lower canaliculus. It is obvious that the longer the ob- uction remains unrelieved the greater will be the danger of irritation of sac from retained secretions, and the greater the risk of lachrymal abscess th all its *attendant evils and subsequent* ill effects; while the sooner the *canaliculus is laid open*, even though it may not be necessary to use

probes to the duct, the greater will be the facility in emptying the sac by pressure with the finger, and of applying astringent or stimulant lotions to its lining membrane by means of the syringe. A further means of checking the tendency to abscess is counter-irritation by the use of tincture of iodine applied by means of a camel's-hair pencil over the skin between the nose and the inner canthus, care being taken that the tincture does not run into the eye itself.

Obstructions in the nasal duct may be caused by inflammatory thickening in the course of catarrhal, strumous, or syphilitic affections of the Schneiderian membrane, and may be seated (1) at the junction of the sac and upper extremity of the duct, (2) in the middle of the duct, or (3) at its lower extremity. The usual effects of obstruction—*e.g.*, overflow of tears and mucus, and subsequent formation of mucocele—will ultimately present themselves, and clinically the features will be the same as those of chronic dacryocystitis. But obviously treatment directed to the lachrymal sac alone will fail to remove the causes of the mischief. Before the formation of a distinct mucocele it may be possible to check the progress of the disorder by the application of stimulant vapours to the nostrils. The use of a mixture of carbolic acid, spirits of wine, and ammonia, by way of inhalation, sometimes succeeds in relieving the congested state of the Schneiderian membrane, exciting a more fluid secretion, and thus removing the obstruction. Stimulant powders, such as scented snuffs, will answer the same purpose when employed in the very early stages of the disorder.

In the event of our failure in the treatment by these simple measures, we must proceed to the use of the probe. I do not restrict myself to the use of any special form of probe for these cases. In a case of simple obstruction, after laying open the lower canaliculus, I employ at first the full-sized Bowman's probes, using, however, a smaller one if that first used fails to pass, or is held tightly within the stricture. It is a good rule to use the large probe first in all cases, there being much less risk of tearing the mucous membrane with the large than with the smaller instruments. A probe with a bulbous end is still safer in this respect. Having passed the probe, it should be left in for ten minutes or a quarter of an hour, in order that it may excite by pressure some amount of increased action in the part. It will be well to ascertain after passing it whether we have placed it in the right position. If it is lying in the lachrymal sac and nasal duct, it will be found that its free end is resting against the upper margin of the orbit, in a line which passes through the centre of the tendo oculi, and cuts the interval between the second incisor (upper) and its corresponding canine tooth below, and the inner extremity of the eyebrow above. This line nearly corresponds to the line of the superficial furrow between the ala of the nose and the cheek. The upper end of the probe should be directed obliquely forwards as well as inwards. Having passed the full-sized probe several times, there is generally a marked improvement in the symptoms; but if not, injection of the sac with some astringent collyrius should be combined with the dilatation with probes; and in this way a cure may almost always be effected in a very short period. But every now and then very obstinate cases are met with—generally old neglected instances of lachrymal abscess, with fistulous opening on the cheek, in which the lining membrane and the bones themselves have become thickened by chronic inflammation. The mucous membrane in these cases is sometimes as stiff and hard as cartilage; and even though a good-sized probe may be passed, the constriction remains, and the epiphora constantly returns.

In these cases I employ Stilling's method, and have been very well satisfied with the results. In order to perform this operation effectually, the patient, unless of very heroic temperament, should be put under the influence of chloroform. The canaliculus having been previously laid open, a probe is passed into the sac, in order to ascertain the seat and nature of the stricture. Stilling's knife being then passed at first horizontally, its point is turned downwards, the cutting edge held forwards, and then carried vertically downwards until it meets with the stricture. This is divided by turning the *cutting edge against it* in three or four different directions; next a full-sized *conical probe is passed*, with the intention of freely dilating the newly divided edges; *and lastly* a silver style introduced, and left in for a week or ten

, or until the discharge assumes a simply serous character. After the re- l of the style it will be necessary to pass a probe about once or twice a for several months, as there is a great tendency to the return of such tures if neglected. It is important, in the treatment of such cases, to rtain that the obstruction to the flow of tears into the nose is not due to periostitis, nor to the presence of necrosed bone. These conditions ld be indicated by inflammatory redness, pain, and exquisite tenderness the bones and cartilages of the nose, and of course the operation de- ed would be entirely unsuitable or even mischievous, when such a set of ptoms present themselves. Various instruments have been devised for sion of strictures of the nasal duct; among others the guarded canula- et (Bowman's) may be occasionally useful; but, in the majority of cases, operation can be better performed with the aid of Stilling's knife than that of any other cutting instrument.

he soft virgin silver is the most suitable material for a style, and it should nade with a narrower portion at its upper end, which can be turned over edge of the eyelid, and so retained in position. For hospital use the leaden style used by Mr. Green, of Philadelphia, answers extremely l. It is a good plan to use a rather thin style at first, and in a week to lace it by a larger one, until at the end of three or four weeks one of the of a crow-quill may be introduced.

n very obstinate cases, or in neglected cases that have been of many years' ation, the larger the diameter of the style employed, the better the nce of a permanent cure.

n the case of threatening lachrymal abscess from any cause, probing is en- ly out of the question; and if there be any periosteal tenderness, or indication of bone mischief, the passing of probes can only be attended h increased destruction of tissue, and, even if succeeding necrosis be not lly due to the probing, the patient, after having suffered the pain occa- ned by it, will not fail to attribute his disasters to the manipulative interfe- ce of the surgeon.

These remarks do not apply to probing of the edges of the divided canali- us, or of the edges of the divided walls of the sac, in cases of abscess, but y to the use of the probe in the way of dilating the obstructed channel into nose. Syphilitic ulceration of the nasal cavities not uncommonly leads abscess of the lachrymal sac and necrosis of the bones surrounding it. In se cases, above all others, probing of the nasal duct is to be avoided; d, on the other hand, an early opening of the abscess is most beneficial. here an abscess has formed, there will be no difficulty in deciding as to the rse to be followed; but it happens now and then that in the early stage obstruction to the flow of tears is the most prominent early symptom, and is in these cases that probing is likely to be used inadvertently. The gnosis of a syphilitic taint will depend upon the usual signs, and especial- upon the presence of ozæna or ulceration, with an offensive discharge from nostrils. The history of the case will often assist us in arriving at a cor- t conclusion. Under circumstances indicating periosteal mischief—such tenderness of the nasal bones, with nocturnal headache of a neuralgic nd,—leeches applied to the inside of the nares, and cold in the form of ice- gs externally, will give the best chance of arresting the disorder, if at the me time free doses of iodide of potassium are given internally, with opiates night.—*Medical Times and Gazette, June* 5, 1875, *p.* 603.

69.—AN IMPROVED METHOD OF TREATING CERTAIN CASES OF CATARACT REQUIRING EXTRACTION.

By James Vose Solomon, Esq., Surgeon to the Birmingham Eye Hospital.

In some ophthalmic works which discuss the cure of senile cataract, the resence *of a deep-set eye is given* as a reason for the selection of depression *reclination in preference to* the operation of extraction. I imagine no sur-

geon who has had experience in such cases will deny that a deep-set eye occasions some embarrassment in the making of the corneal section with a Graefe's or Beer's knife, especially where anæsthetics are not employed.

In a case recently operated upon at the Birmingham Eye Hospital, I improvised a simple and effective method of overcoming the difficulty under consideration by making with a pair of sharp scissors a perpendicular incision through the substance of the lower lid of about three-eighths of an inch in length and one-sixth of an inch from the commissure. Steady continuous pressure by means of a small sponge restrained the bleeding within innocent limits. The front of the eye having been now made easy of access to the knife, the section of the cornea was completed without difficulty, and the lens safely delivered without accident. No anæsthetic was employed. The lid was not sutured, but dressed with cerate instead of dry rag, and two turns of a narrow domett roller. The patient, a collier of sixty-eight years, recovered without a single painful or unfavourable symptom, and was discharged cured on the fourteenth day of the operation, with a clear black pupil, good vision, and perfect cicatrisation of the tarsal cartilage.

The above plan should have preference to any that interferes traumatically with the condition of the commissure, from the impossibility of its inducing abnormal contraction of the palpebral aperture or inversion of the lid (entropion)—accidents of no mean importance.

The operation of *reclination* has fallen into undeserved neglect, and, as a consequence, eyes are destroyed which would have had a good chance of vision if it had been selected for performance instead of extraction. A resort to it would be advisable where there is extensive fatty degeneration of the cornea and other tissues, and in subjects in whom the arteries have become seriously spoilt by atheroma, also in those who are affected with tertiary syphilis of old date. In the last two pathological conditions, intra-ocular hemorrhage is the complication to be dreaded after the removal of the lens, or even upon the mere evacuation of the aqueous humour (no hypothetical case); in the first, death of the corneal flap within eighteen hours of the performance of the extraction is not uncommon.—*Lancet, July* 31, 1875, *p.* 167.

70.—A NEW FORM OF ARTIFICIAL MEMBRANA TYMPANI.

By George Field, Esq., Aural Surgeon to St. Mary's Hospital.

In treating cases of perforation of the membrana tympani, it has always appeared remarkable that some patients should derive benefit from Yearsley's pellet of moistened cotton-wool, while others gain greater advantage from Toynbee's artificial membrane. It has, therefore, occurred to me that the instrument I am about to describe might prove advantageous; and such I have found to be the case. It is simply a combination of Toynbee's artificial membrane, viz., a thin disc of india-rubber mounted on a fine silver-wire stem, and Yearsley's cotton-wool. In my instrument, the wire is carried beyond the india-rubber for about a quarter of an inch, and terminates in a second disc, made of flannel. The space between the two is filled up with a small portion of Dr. von Bruns's wound-dressing cotton-wool, which is absorbent, and so takes up and communicates to the flannel disc any medicated solution which it may be desirable to apply. To prevent overcharging the cotton wool, a pipette should be used, as one or two drops are sufficient to moisten every fibre of the wool and flannel.

Its advantages are the following :

1. It does not irritate the membrane, and being very soft, is not likely to injure it.

2. It is made of cotton-wool, which is absorbent; lotions can by this means be constantly applied with much advantage.

3. By thus keeping the part clean, the membrane gets into a healthy state, *and the perforation* heals.

4. The hearing distance is improved.

5. It is not liable to leave the india-rubber disc in the meatus.

6. It is easily used; and does not require the forceps, as is the case with Yearsley's cotton-wool.

The following cases are interesting.

E. F., aged 26, a clerk, came to consult me at St. Mary's Hospital, having suffered from deafness for twenty years. Both membranes were perforated. On the right side, there was a large perforation; he could not hear my watch on contact. On the left side, there was a smaller perforation; he heard the watch at the distance of an inch. On the right side, Toynbee's membrane increased his hearing about seven inches; cotton-wool had no effect. In the left ear, Yearsley's mode of applying cotton-wool answered best; the india-rubber disc having very little effect on this side. With my instrument, he can hear nearly eighteen inches on both sides. His hearing is thus greatly improved. The membranes are gradually getting into a healthy state. He says "he can now hear sermons," a benefit he was never able previously to enjoy.

H. J., aged 19, came to consult me at St. Mary's Hospital. She had been deaf for two years in both ears. The deafness came on after measles. She had a large perforation of the membrana tympani on the right side, with constant offensive discharge. She could not hear a watch on contact. After the new artificial membrana tympani was used, her hearing improved one foot, and by using (by this means) various lotions applied directly to the perforation, the discharge has gradually ceased, and her hearing distance when wearing the instrument is now one yard, and about four inches without it. The membrane now looks healthy, and the perforation is decidedly smaller.

W. D. had perforation of the left membrana tympani. He could not hear a watch on contact. He had been deaf eight months; the deafness came on after "brain-fever." This boy's hearing improved four inches, and the discharge, which had previously been very great, has ceased altogether.

H. L., aged 17, had had deafness for five years in both ears after scarlet fever. There were large perforations in both membranes. With Toynbee's artificial membrane, her hearing is greatly improved, four to five inches. The application of the cotton-wool also affords benefit; but, with the combination of the two, a much better result is obtained; for, when she wears them in her ears, she can hear ordinary conversation perfectly well, and the hearing distances were twelve and fifteen inches. The lotion she has lately used (which has quite stopped the discharge) consists of two grains of the nitrate of silver to the ounce of water; she says, also, that when wearing them, the sound seems much clearer than with the others.

S. M., aged 26, had perforation of both membranes, much the same as the last case. It came on from scarlet fever. Her hearing is improved to a very great extent on both sides. She says that my instrument is much more comfortable than the other, and does not move about like the india-rubber one; she also hears double the distance with it. The discharge has stopped.

I have several other cases of the same kind, both in hospital and in private practice, in all of which the benefit has been the same.

My predecessor at St. Mary's, Dr. Peter Allen, was of opinion that in Yearsley's contrivance (when the natural membrane is perforated or lost) the benefit is derived from support given to the ossicula, by which they are enabled to exercise that due pressure at the fenestra ovalis, which keeps the membrane of the fenestra rotunda in a condition susceptible of vibration, and capable of transmitting them to the nerve-expansion of the labyrinth. And Yearsley says himself that his object is to support the remaining portion of the membrana tympani or the ossicula, and that care must be taken that the entire opening be not covered, otherwise the experiment will not succeed; it is also indispensable to success, that the moisture of the wool should be preserved.

Toynbee, on the other hand, says, "It seems to me no doubt but that one of the functions of the membrana tympani is to confine the sonorous undulations to the tympanic cavity, in order that they may be concentrated on the *membrana fenestræ rotundæ*. Indeed, it is probable, that the vibrations only

partially pass through the chain of bones to the vestibule, and that the air in the tympanic cavity is one great medium of communication with the labyrinth. If the means of communication with the labyrinth be the air in the tympanic cavity, it is palpable that any aperture in the membrana tympani is likely to diminish the power of hearing, by permitting the vibrations to escape from that cavity into the meatus, and so prevent their concentration upon the membrana fenestræ rotundæ."

But, in the supplement of his book, Hinton says, "Mr. Toynbee, also, modified the view he at first entertained. This he was partly led to do by intercourse with Dr. Julius Erhard, who, without any perforation, found his hearing much improved by the use of cotton-wool, and published his experience in a paper entitled, Deafness Curable by Pressure."

Roosa says, "That the artificial membrane is only of service in cases of partial or complete loss of the drumhead."

Von Troeltsch is of opinion, that the action upon which the benefit mainly depends is the pressure on the remaining portion of the membrana tympani and the chain of ossicula; whether it be that, by this mechanical influence a morbid relaxation in the connection of the ossicula is removed, or the fluid in the labyrinth is put under increased pressure. Such an india-rubber disc will act as a vibrating plate, and can transmit a considerable number of vibrations to one of the ossicula. (Politzer.)

This appears to me to be the best explanation. I use the cotton-wool for the necessary pressure on the remaining portion of the membrana tympani, and, at the same time, the india-rubber disc as a vibrating plate.

The improvement I suggest I have found of great service in nearly all cases of perforation. The instrument should not be worn at first for more than an hour at a time, the cotton-wool should be often changed, and the lotions altered occcasionally; and, lastly, it is very essential that only a very small quantity of fluid should be applied to the cotton-wool.—*British Medical Journal*, *June* 19, 1875, *p.* 806.

SYPHILITIC DISEASES.

71.—ON INHERITED SYPHILIS.

From a Review by the Editor of the British and Foreign Medico-Chirurgical Review.

[By inherited syphilis is meant the disease which is originated from contamination of the ovum in utero.]

As, in doubtful cases, the diagnosis of inherited syphilis is greatly aided by the condition and history of the parents, it is very necessary to bear in mind the several sources and methods of infection. These we briefly state.

1st. It may be derived from the father, who, being the subject of syphilis, conveys the disease to the ovum by means of the semen. 2nd. From the mother, by means of the placental circulation, whereby the infected blood is conveyed from the mother into the system of the fœtus. 3rd. Both parents may be syphilitic, and therefore both the above-named modes of infection take effect. And it may here be remarked that the reverse of the second method of infection may take place, that is to say, a healthy mother may, by means of the placental circulation, be infected by a syphilitic fœtus, which derives the disease from the vitiated semen of the father—an occurrence which explains the cases in which a woman who has never had primary syphilis may exhibit secondary symptoms after nourishing an infected embryo.

The malignity of the disease is in proportion to the intensity of the infection, and this is affected by two causes: first, the mode of derivation; secondly, the period of the disease in the progenitor. As to the mode of derivation, *that is*, whether from father, mother, or both parents, the rule is that

ction is most intense if both parents are diseased; that disease of the alone is the next most potent cause; and of the father alone the least. to the period of the disease in the progenitor, it is well established more remote the time of impregnation from the period when the pa- t contracted the disease, the less profound will be the infection of the . This is the case even independently of treatment. Thus a common is such as the following. A woman the subject of syphilis had three born dead; at the fourth conception a living child was born, but so lly infected that it soon died; the fifth child was less diseased and and treatment was reared. Should there be other children they may less infected until the latest may only present one or two symptoms, in the absence of the history, would hardly be recognised as syphi- In the majority of cases the symptoms of inherited syphilis do not ap- til a few weeks after birth, although the child often seems feeble and of an unhealthy hue : there is no doubt, however, that a child may with symptoms of the disease. The greater number appear healthy , and first show symptoms of infection about a month afterwards. As au remarks, it is unusual for the symptoms to occur before the second r, *for the first time*, after the eighth month. But it is important to re- r that a child who has been in apparent health for months, or even may suddenly show symptoms of inherited syphilis, it may be thought first time. We have lately seen a girl of 14 years in whom this occur- But on investigation it will almost always be discovered, as in the case l to, that the child had some manifestations of the disease soon after to which perhaps but little importance was attached, or which soon ed under treatment, and which having lain latent for a long time, were gain educed by some depressing influence, such as one of the acute c diseases of childhood, bad hygienic condition, or the like.

not necessary to enter upon a description of the ordinary symptoms of ed syphilis, which are sufficiently well known; but there are a few of which we think are of greater value than the text-books would lead one pose. For instance, there is none more striking than the physiognomy infant. The physiognomy of disease generally is a subject well worth ; every one must recall instances in which he has diagnosed from the lone, cases of peritonitis, phthisis, chorea, and other affections; and in ease is the facies more characteristic than in inherited syphilis. Trous- as given of this, as of so many other diseases, a most graphic descrip- He describes the complexion as of a bistre tint; and there is a strik- ok of premature old age about these infants; the skin too is shrivelled, dy emaciated, and often there is a peculiar smell about the patient, hich we know of no better comparison than that of a damp vault.

of the earliest and most constant symptoms is what is known among oor as "the snuffles," that is, a thick discharge from the nasal mucous rane, which blocks up the nares and causes a snuffling with the respi- , and a great, and sometimes serious, obstacle to sucking. It also pro- an alteration in the voice, so that the infant's cry has a peculiarly high- ed or twangy sound. Then there are very constantly sores about the flat mucous tubercles or round copper-coloured, rather shining spots g a tendency to desquamation. Mucous tubercles occur also about the s of generation, the mouth, the genito-crural fold, the axilla, between ngers and toes, between the chin and lower lip ; in fact, as Diday has rked (giving the true explanation of their character) in any part where kin is "thin, moist, and exposed to friction." The same kind of erup- takes place on the mucous membranes, and if the mouth is examined, are frequently found white patches or ulcerations of a round or cres- ic form, scattered about its lining membrane. A favourite position for is the point of reflexion of the mucous membrane of the lips on to the s, and the frænum of the upper lip; another is the border of the isthmus he fauces. The extension of this eruption to the larynx gives rise, accord- to Diday, to another symptom frequently met with, namely, hoarseness, the high-pitched note associated with snuffles, but a true hoarseness, very

unlike the usual note of an infant's cry. Diday says this depends upon the eruption specially affecting the edges of the aryteno-epiglottidean folds.

Of the other eruptions the most common is a roseola, and this has less of the coppery hue than the other syphilides of infants. It chiefly affects the chest, neck, and inner parts of the thighs, is an early symptom, and is distinguished from the other exanthemata, such as scarlatina, but not being accompanied with febrile disturbance, by its imperfect disappearance on pressure, and "by its maintaining the same colour and degree until its termination." On the palms of the hands and soles of the feet there is commonly desquamation, giving an appearance of psoriasis. This is very characteristic of inherited syphilis. Besides this there is a kind of intertrigo seen very often, which differs from the ordinary intertrigo in its surface having a less bright red colour, but a much more shining or polished appearance, accompanied by a tendency here and there to slight desquamation. Eczema and impetigo are also not unfrequent symptoms, and are each of them of a darker tint and less acute character than when unassociated with syphilis. There has been much discussion as to whether or not the pemphigus of new-born infants is a syphilitic eruption. We are hardly able to assert that it is invariably of syphilitic origin, but certainly the subjects of it usually present other symptoms of inherited syphilis. Such a case as that related by Dr. Bulkley, in which the eruption continued to develop for nearly a year, and the child died of syphilis, is very strong evidence of its syphilitic character.

Another very common symptom is the existence of fissures or cracks at the edges of the lips and nares and the angles of the mouth, the scars of which are often valuable evidence of former mischief. The hair often falls off; so do the eyelashes, leaving a sore edge to the lids.

[The visceral lesions of inherited syphilis differ altogether from those of the acquired disease of adult life. They occur very early in the disease and are of the suppurative type, and progress very rapidly. Deafness, ulcerations of the pharynx and tongue, laryngitis and lupus are among the less common of the latter manifestations of the disease.]

There has of late manifested itself in the profession a growing scepticism of the powers of medicines; a reaction, as we think, such as we see in so many other matters, from the unreasoning and sometime unreasonable belief in their virtues which preceded it: but none the more founded upon intelligent observation and deduction. But we think no one who has watched the effects of mercury given in cases of inherited syphilis ought to doubt the potency of at least that drug. We know few things in therapeutics more satisfactory than to witness the improvement of children thus treated; they rapidly fatten, lose their shrunken aspect, and change from little old men, to actual infants; the eruptions fade, the sores heal, and the progress is often astonishing. We do not of course assert that this is the case in all; there are many children so profoundly affected by the disease that they die before remedies have time to act; or they may be born with fatal lesions already developed. But we cannot doubt that we possess great power over this disease, a fact which alone must always give an interest to its study, and an importance to its recognition.—*British and Foreign Medico-Chirurgical Review, July* 1875, *p.* 23.

73.—ON SYPHILIS, AND ON SOME LOCAL DISEASES AFFECTING PRINCIPALLY THE ORGANS OF GENERATION.

By Henry Lee, Esq., Professor of Surgery and Pathology to the Royal College of Surgeons.

[Where the life of the blood is interfered with, the nutrition of every part of the body is affected. In the following lecture the morbid processes by means of which it is so influenced are considered.]

The results produced in the human body by the syphilitic poison are so various, *affect a patient's* constitution at such different periods, and are apparently so dissimilar in different cases, that it is necessary in studying this

disease to distinguish accurately if possible between the essential actions which belong to the disease itself, and the various complications which may arise from lapse of time, from weakness of constitution, from the differences in the manifestations in its earlier and later stages, and especially from effects of accidental complications, or from the modifications produced by its recurrence.

Hunter prefaces his treatise on the venereal disease by the description of four morbid processes or actions, to which he constantly refers in his subsequent remarks. Since his day the nomenclature of these actions has been much varied and altered; but, as conveying any distinct and definite ideas, I do not think that it has been improved. These actions he calls the adhesive inflammation, the suppurative inflammation, ulceration, and mortification.

But in order to make his description of these processes available for our present purpose we must also consider how these actions are modified by the structures in which they occur.

An animal body, Hunter observes, is composed of a variety of substances, and we have an opportunity of observing the comparative progress of disease in them, and their comparative powers of restoration, and we find that they differ very much from each other in those respects. The healthy and morbid processes in growth, decay, and repair, are, however, regulated by the same living principles, or, if we please, guided by the same hand, in all living beings and in all diseases. In diseases arising from accident, a great difference in the degree of action takes place, according to the nature of the parts implicated: thus bone, tendon, ligament, and cellular membrane go through their morbid actions more slowly than muscle or skin. This principle is also abundantly illustrated in the different morbid processes produced by venereal diseases.

The same kind of action which produces an effusion of lymph upon the iris may, if it attacks the skin, be followed by a variety of modifications in the growth and development of the cutis or its coverings. If the cellular membrane be affected, an indolent tumour may result, which goes comparatively slowly through its stages, and may terminate in mortification, or perish by a still slower process of molecular necrosis. In the bones the same disease produces an increased development of bone, ulceration, or necrosis. In the lymphatic glands an enlargement is produced, confined strictly to those glands themselves, and not involving—at least, in the first instance, in any degree—the surrounding structures.

In internal organs the same disease may produce deposits, such as are illustrated in this preparation of syphilitic disease of the lung, and in this of syphilitic deposit in the liver. These deposits may be more or less perfectly absorbed, or more or less perfectly transformed, in the processes of nutrition and growth into tissue, resembling that of the organ in which they occur.

Case 12.—A gentleman has a secondary syphilitic eruption and symptoms of disease of the lung. For the latter disease he consulted a number of medical men, and was for a long time under treatment. The symptoms, however, persisted. As he wished to go abroad, I was requested by Dr. Tuke to see him for his secondary symptoms before he went, and he was accordingly placed under treatment, which he had not time fully to carry out, but the eruption almost entirely disappeared, and with it all his lung symptoms. These had not returned two years afterwards.

Case 13.—A patient in the Lock Hospital, many years ago, was pronounced by the physicians of the hospital to have one lung in great part consolidated. I did not know at the time what the disease might be, but I thought I would, at all events, treat his secondary symptoms. These disappeared, and with them the lung affection, and he was seen some months afterwards in apparently perfect health, following his occupation as an omnibus conductor.

The most important modification of increased action, as far as our present subject is concerned, is that which is observed in mucous membranes as compared with other structures in the body.

Hunter showed that a mucous membrane under violent irritation would, like a serous membrane, produce lymph; but, generally speaking, inflamma-

tion of a mucus membrane terminates either in resolution, and increased secretion of mucus, or in suppuration. But although the secretion from the surface of a mucous membrane differs in general from that of a serous membrane, yet the membranes themselves may be affected in a similar way. Effusion of new material may take place in their structures, and in the cellular tissue in contact with them. They may both become infiltrated, thickened, and permanently altered. With regard to the serous membranes, we often see an example of this, as in the case of old omental hernise; and with regard to the mucous membranes, most interesting examples are afforded, in illustration of our present subject, in the formation of mucous tubercles, and in the more or less permanent thickening of the mucous membrane of the urethra. These will hereafter occupy our attention particularly. I will only at present note that the mucous membrane of the urethra may be thickened by the syphilitic poison, as shown by cases similar to the following, which in practice are not very uncommon.

Case 14.—A young gentleman contracted syphilis, followed by secondary symptoms. He had never had gonorrhœa. In the course of the manifestation of the secondary affection the stream of water gradually diminished. He had apparently an ordinary stricture, which was cured by the specific treatment, without the use of instruments. There was no urethral discharge in this case.

When the venereal poison, Hunter observes, is applied to the skin, its effects are generally manifested first in a pimple, which is commonly allowed to scab. The scab is generally pushed off or rubbed off, and one larger than the first forms. Hunter defines this process of scabbing as the first mode of healing a wound or sore in which inflammation may be greater than where union can be effected, but not nearly so great as where suppuration takes place. We shall, I think, understand Hunter's idea in this respect by considering what he says with regard to the constitutional forms of the disease. "When the poison has got into the blood it there irritates to action. There are produced from that irritation many *local* diseases, as blotches on the skin or thickening of the periosteum and bones." These forms of disease he calls compound or constitutional; yet he says they are not strictly so, for every complaint, in consequence of the malady, is truly local, and is produced by the simple application of the poison to the parts. Now if this be true, as I believe under given conditions I shall demonstrate it to be, the distinction between what we have been in the habit of calling primary and secondary syphilitic affections in a great measure disappears; and in truth, in uncomplicated cases and in a healthy constitution, where there is no accidental cause of irritation, the local and the constitutional manifestations very much resemble each other, and are in fact of the same nature. One of the first cases of syphilis which I recollect affords an illustration of this.

Case 15.—A boy, scarcely arrived at puberty, had a small, circular, slightly elevated induration on the skin of the penis. This soon became covered by a thin scale. In due course a scaly eruption appeared on the body, and the appearances of these very accurately resembled the primary affection. The disease ran its course without ulceration or suppuration of any part.

Case 16.—A gentleman had a small crack on the middle of the lower part of the prepuce, which had often caused him some annoyance. On one occasion, after a suspicious intercourse, the edges of the crack became indurated. The induration was to a very limited extent, perfectly circumscribed, and was accompanied by enlarged glands in the groin. He could hardly believe that it was of any consequence. It was, however, followed by a specific eruption, which continued, on and off, for about three years; but none of the secondary manifestations ulcerated or suppurated.

Case 17.—A gentleman had a very slight induration on the skin on the right side of the penis. It was quite unattended by any irritation or ulceration, and so slight that I doubted as first as to its nature. It however persisted, was accompanied by slightly enlarged glands in the groin, and remained accurately circumscribed. I then told him my opinion. He, however, did not think it could be syphilitic, so trifling was it in appearance. In *due time, however,* a scaly eruption appeared on the body, and continued on

and off slightly for several years. This patient had never had gonorrhœa, but as the successive secondary manifestations of syphilis developed themselves he had occasionally a thin discharge from the urethra, unaccompanied by any ardor urinæ. It had the appearance of thin gruel, and left a stain upon the linen. I have no doubt but that it arose from a secondary inflammation of the mucous membrane of the urethra. Now these, and many more which I could mention, afford illustrations of adhesive inflammation only. In both the primary and the secondary affections an attempt was made to heal by scabbing, but in this disease the attempt does not succeed, and successive scabs or scales are formed. These are all modifications of the adhesive inflammation, which would terminate in resolution if its cause were not persistent. Many drawings of my own and of others demonstrate the fact that what we call the primary disease may go through its stages without any suppuration and without ulceration; and here I would observe that it is a characteristic of both the primary and secondary affections of this disease that in uncomplicated cases they leave no scars on the body. They are attended with no loss of substance, and, as we shall hereafter see, the artificial inoculations from these affections follow the same rule. It is quite true that it comparatively seldom happens that the syphilitic poison runs its course without some accidental causes of irritation. This may depend upon some other irritating fluid being applied at the time of inoculation, upon want of power in the patient's system, or upon the changes which occur in the original products of the adhesive inflammation. The true characters of this inflammation in primary syphilis are given by Hunter with comprehensive clearness and brevity. The process results in a peculiar thickening, very circumscribed, not diffusing itself gradually and imperceptibly into the surrounding parts, but terminating rather abruptly. This description is perfectly true, whether the induration be scarcely thicker than a layer of cuticle, or whether it involves the whole thickness of the skin. It retains these characters through all its stages, though they may be obscured by accidental circumstances. The secondary affections also maintain this circumscribed character, but are unattended with the peculiar defined induration, for a reason which will hereafter be more fully considered. This induration, according to the Hunterian doctrine, depends upon the effusion of lymph, the product of adhesive inflammation. If the lymph were produced from a non-specific cause, it would be organised and converted into a tissue similar to that of the surrounding part, and ultimately anything that was redundant would be absorbed. But the life of this lymph is touched with the same disease as the blood, or the products of the blood from which it is derived. It has a vitiated existence, and tends soon to pass, except in very vigorous constitutions, into a state of degeneration. This may manifest itself in various ways: (1) by an unhealthy formation of epithelium, producing various kinds of scabs and scales; (2) by unhealthy growth of the hair, nails, or teeth; (3) or by the effusive matter itself undergoing a kind of molecular necrosis, suppuration, or ulceration. These latter processes, although they may occur in all stages of the disease, are most marked when the poison is first received, because then acting on a virgin constitution. Accordingly, we find that the adhesive inflammation first produced, in the majority of cases passes from the adhesive stage to some other form. The product is no longer fit for the life of the part, and is thrown off in one of the forms above-mentioned. A double action then goes on, one of adhesive inflammation, accompanied by induration, another of throwing off of diseased cuticle, or suppuration or death of the newly-formed tissue.

These two consequences, the induration and destruction of the newly-formed tissue, as Babbington has observed, seem to be distinct and independent actions, since, although they generally exist in conjunction, they are sometimes found separate, one or the other of them being in some cases wanting. These two processes may sometimes be witnessed in the same case at different times under the influence of treatment. A patient may have a well-marked primary induration, and under the action of mercury the induration will disappear, and a soft sore will only for a time present itself, but after an interval *the induration will reappear* with its specific characters.

Now, all the cases which I have given in the previous and in the present lectures are instances in which the poison of syphilis produced at first the adhesive action only, by means of which the nutrition of parts was more or less perverted, both in the primary and secondary manifestations of the disease. Coinciding with and confirming these practical observations are the results of direct experiment.

. *Case* 18.—A patient, under the care of M. Puche, in the Hôpital du Midi, was inoculated on the abdomen on the 29th of January, 1861. The inoculated matter was taken from an indurated chancre, which had existed six weeks, and which was followed by secondary symptoms. On the 19th of February, as no result had appeared, the patient was inoculated from another indurated chancre. On the 8th of March, thirty-nine days after the first inoculation and seventeen days after the second, two little pimples appeared on the inoculated spots. The first became excoriated after the lapse of some days, but the second presented on its summit a small point of suppuration. Both presented the specific induration of primary chancres. On the 10th of April this patient had a general eruption of roseola.

Case 19.—Rinecker records the following:—On the 13th February, 1852, an inoculation was made on Dr. Warnery. This was effected by means of a blister. The blistered surface soon healed. On the 9th of March, however, it became inflamed. Infiltration had taken place in the skin, which was hard and thickened. On the 21st of March, thirty-five days after the inoculation, and thirteen after the appearance of the specific primary symptoms, the blistered surface was covered by a mass of tubercular excrescences. These were copper-coloured, raised above the surface, and in some places confluent. They were covered for the most part with brown crust, slighty adherent, or with thin grey scales. Eleven weeks after the inoculation he had severe pain in the head, followed by a syphilitic eruption on the head and face. This was succeeded by inflammation of the soft palate and neighbouring parts, with a superficial exudation of lymph. Ultimately mucous tubercles appeared on the scrotum, the perineum, and on the inside of the thighs.

Case 20. (Related by Baerensprung.)—M. C. had never had syphilis. She was inoculated on the right thigh from an indurated chancre in three places. The inoculation was made on the 28th of May, 1859. On the 1st of June the inoculated spots appeared as little red points, without any surrounding inflammation. On the 6th of June it was impossible to distinguish them. On the 25th, however, three little red tubercles appeared on the inoculated parts. On the 5th of July the corresponding glands in the groin were enlarged. The tubercles were also considerably increased in size, and ulcerated on their surface. On the 12th, two of the tubercles had united, and presented a raised, accurately defined induration. The inguinal glands were very hard, and not painful. On the 20th this ulceration was the size of a franc piece, with a base almost as hard as cartilage. There was no suppuration, but the surface was covered by an adhesive secretion. On the 29th there was an eruption of roseola and mucous tubercles.

Case 21. (Recorded by Lindwurm.)—M. had never, as far as could be ascertained, had syphilis. She was inoculated with the secretion of two indurated chancres of a patient who at the same time had secondary symptoms. No immediate results followed. Fifteen days after the inoculated points reappeared as two little red stains, which insensibly became transformed into little reddish-brown tubercles. On the 28th there was superficial erosion of these little tubercles, followed by excoriations covered by thin brown crusts. On July 8th these so-called ulcerations had increased and were surrounded by slight induration. The corresponding inguinal glands now became enlarged, and subsequently the glands in the opposite groin. A papular eruption followed, especially upon the organs of generation.

Case 22. (Also recorded by Lindwurm.)—A young woman was inoculated with the secretions of the chancres of the previous case on the 10th of July, and again on the 12th. Some small pustules followed these inoculations, and became covered by small scabs. The whole of these inoculations were healed in seven days—namely, on the 17th of July. On the 29th of July, *however, although all* traces of the inoculations had previously disappeared,

five red tubercles, corresponding with the inoculated points, showed themselves. These tubercles became covered by thin crusts, and converted into indurated chancres. In the middle of September the manifestations of constitutional syphilis were developed.

Case 23. (Recorded by M. Rollet.)—A patient was inoculated from an indurated chancre. Eighteen days afterwards a papule was developed, which became ulcerated on its surface. This, as M. Rollet believes, was prevented from being developed into a regular indurated chancre by antisyphilitic treatment.

The examples of artificial inoculation hitherto given are cases in which the inoculated matter was taken from primary syphilitic sores. The following are instances in which the inoculated secretion was taken from some secondary affections.

Case 24. (Reported by Gibert.)—A patient, affected with lupus of the face, was inoculated on the left arm, by means of a blister, with the secretion of mucous papules from the anus of another syphilitic patient. Five days afterwards there was no trace of the effects of the inoculation, and at the expiration of nine days a little redness only was left on the blistered surface. On the eighteenth day of the inoculation a raised copper-coloured papule appeared on the inoculated spot. On the twenty-second day a little exudation appeared on the surface of the papule, which was enlarged. On the twenty-ninth day there was an enlarged gland in the corresponding axilla. On the thirty-second day a crust was detached from the surface of the papule, which was superficially excoriated. On the fifty-fifth day the papule had become converted into a tubercle, which was superficially raised and indurated. Some red spots now appeared on the body. These soon showed themselves also on the anterior surface of the arms, the inside of the thighs, and the inguinal regions.

In another instance (Case 25) mentioned by Gibert, the period of incubation between the inoculation and the appearance of the first local symptoms was twenty-five days. A little redness then appeared, followed first by a dry papule, which subsequently became moist and excoriated. It then became covered by a crust and indurated, and ultimately became a tubercle, which ulcerated on its surface, as in the preceding case. A corresponding lymphatic gland became enlarged, and thirty-seven days after the inoculation a rash of roseola manifested itself on the patient's body.

Case 26. (Reported by Lindwurm.)—A patient affected with lupus had a small blister applied to the neck. On the blistered surface a small piece of the mucous membrane of a syphilitic tubercle on the lip was applied. The wound in the neck appeared to heal in five days, but three weeks later the wound again inflamed, and an ulcerated papule appeared. This was followed by enlargement of the cervical glands and copper-coloured blotches.

Case 27. (Reported by Wallace.)—A young man was inoculated in three places on each thigh from the syphilitic pustules of another patient. In this case the punctures were first made, and the secretions of the postules applied to them. The punctured spots did not inflame. Thirty days afterwards the patient complained of heat on the inoculated spots. Two of the spots on the left thigh, and all three on the right, presented little raised pimples of a reddish-brown colour, with faint scales on their surface. One of these scales became a scab, and when raised exposed a superficial ulceration. The corresponding inguinal glands were enlarged. The pimples soon became converted into ulcerated tubercles, which were round, slightly depressed in the centre, and of a dirty white colour, like condylomata. A scaly eruption on the body followed.

Case 28. (Reported by Vidal.)—M. Boudeville was inoculated on the 1st of November with the secretion of the pustule from a syphilitic patient. A papule appeared on the 3rd; this became covered by a crust, under which some pus formed. This continued until the 15th, when the local inflammation subsided. Thirty-five days afterwards, however, a fresh action commenced. Two fresh pustules made their appearance at the inoculated points, and were very long in healing. Flat lenticular pustules on the head, loss of hair, en-

largement of the cervical glands, sore-throat, mucous tubercles, and an eruption of roseola followed.

Case 29. (Reported by Rinicker.)—On the 9th of January, 1852, a young physician was inoculated on a small blistered surface with the secretion of a syphilitic eruption of a child. On the 10th no visible effects had followed the inoculation. On the 20th there was a papular eruption around the inoculated spot. This soon disappeared. On the 2nd of February a fresh action commenced. The surface which had been blistered was red, itching, and scaly. Twenty-nine days after the inoculation this surface was of a deep red-copper colour, the skin was hard and infiltrated, and presented several papular elevations. On the 10th of February the whole surface which had been blistered was covered with reddish-brown, hard tubercles, covered with scales. In spite of the use of mercurial ointment, these local affections were followed by ulceration of the palate, of the lower lip, and of the left side of the frænum of the tongue, and later by mucous tubercles on the scrotum.

Case 30. (Reported by Waller.)—A boy of twelve years of age was inoculated with the matter from a syphilitic patient on the 6th of August, 1850. The matter was placed by means of a small piece of wood and lint on wounds made by a scarificator. At the end of four days the wounds made by the scarificator had healed. On the 15th of August there were some red spots on the inoculated parts, and on the 30th fourteen tubercles presented themselves in the same situation. These were of a dirty red colour, hard to the touch, and almost exactly circular. Some of them presented a slight desquamation. The following days the tubercles increased in size, and all became confluent. When the crust was removed, the tubercles appeared slightly excoriated, raised, and flat. They soon again became covered by fresh thin scales, which were of a grey colour and dry. Twenty-seven days after the appearance of these tubercles, and fifty days after the inoculation, a syphilitic eruption appeared, which soon covered the whole body.—*Lancet, July* 24, *p.* 121.

73.—ON THE TREATMENT OF SYPHILIS.

By Henry Lee, Esq., Professor of Surgery and Pathology to the Royal College of Surgeons.

Sir B. Brodie, following Mr. Pearson, gives the decided preference to the inunction of the mercurial ointment to all other plans of treatment in use in his time. He says:—

"When the symptoms are not of a mild character, the patient should, if possible, be confined to the house, except for an hour or two in a fine day. The going out into the fresh air (as Mr. Pearson observed long ago) will counteract the influence of mercury. You never can be responsible for thoroughly eradicating the disease where the patient is at all exposed to cold or wet, nor where he does not lead a perhaps regular and careful life in all respects.

"In all cases of syphilis in which you employ mercury, remember that you have two objects in view: the first, to cure the present symptoms; the second, to prevent a return of the disease. It seems to me that a great number of practitioners at the present day regard only the first object, and lose sight of the second. I have frequently seen a person who has taken mercury for a chancre, which has, perhaps, healed in a fortnight, and then has left it off, although a very hard cicatrix has been left. Under such circumstances, in nineteen cases out of twenty, there will be secondary symptoms. If mercury be taken for the primary symptoms, the patient should never leave it off till the hard cicatrix has disappeared, nor indeed for some time afterwards; and so, where it is given for secondary symptoms, it should be continued for a considerable time after they have disappeared. A man has an eruption of *the body; it fades* away, under the use of mercury, in the course of a month; *but the remedy must* be used as a prophylactic for another month. If a pa-

tient be confined to his house, or only allowed to go out a little on a fine day; if he be made properly to rub in the ointment, and the course be carefully watched and continued for some time after the symptoms have subsided, you will, I am satisfied, in the great majority of cases, make a real and permanent cure of the disease. I suspect that this is not the way in which it is administered by the majority of practitioners at the present time, but it was so administered formerly. You must not suppose that we have advanced alike in all departments of surgery; indeed, I am sure that in some things we have gone back, and I believe this to be one of them. I am much mistaken if the mercurial treatment of syphilis, as employed by the late Mr. Pearson during the greater part of his life, was not as nearly perfect as possible. At any rate, it was much more successful than the less careful treatment of modern practitioners. That gentleman was surgeon to the Lock Hospital; and having no general hospital to attend to, the powers of his mind were more especially devoted to the study of syphilitic diseases and their treatment; and the practice which I have now recommended was that which he usually adopted. When I was young in my profession I had frequent opportunities of meeting him in private practice, and of learning how profound a knowledge of the subject he possessed; and I may take this opportunity of recommending for your perusal his treatise on the various articles of the materia medica recommended for the cure of syphilis, in which he offers many excellent observations on the use of mercury, and enters into details in a way in which it is not my object to enter into them at present."

The preparations of mercury generally used were the blue pill, the mercurial ointment, calomel, corrosive sublimate, and the iodides and bromides of mercury; for fumigation, the grey oxide and the bisulphuret.

On account of its convenience, and the little trouble it gives, the administration of mercury in the form of pills is that which the patient prefers. But mercury can seldom, if ever, be given in this way long enough to cure the disease. It acts upon the patient's stomach and intestines before it has accomplished its object, and it then has to be discontinued. It may for a time, however, be usefully employed either by itself or in combination with external treatment. Three grains of blue pill, with half a grain of opium, night and morning, or half a grain or a grain of the iodide of mercury, with a quarter of a grain of opium, night and morning, are convenient modes of giving mercury internally, and will in general soon produce its specific action. The corrosive sublimate or perchloride of mercury can never be trusted to for the cure of syphilis, although it is a valuable auxiliary in some stages of the disease.

The inunction of the mercurial ointment is the plan of treatment recommended by Mr. Pearson and Sir B. Brodie. This answers very well if a patient will carry it out, but it is not often in private practice that this can be accomplished. It involves a considerable amount of trouble, and the patients object to the dirty appearance on their skin and on their clothes. This last objection has of late been partially removed by the introduction of the oleate of mercury. In some patients the skin does not bear the inunction of mercury well. A crop of pustules not unfrequently appears, and this sometimes gives the patient a considerable amount of annoyance. Mr. Pearson was in the habit of commencing by the inunction of half a drachm of strong mercurial ointment every night, and he was very particular during the treatment not to allow the patients to be exposed to the influence of cold air. He kept them to their room and sometimes to their bed. The advantage of this plan he found to be that the stomach and bowels did not often suffer from the action of mercury as a metallic salt; a larger quantity of mercury could be administered; the specific powers of mercury could be obtained with great certainty, and sometimes advantage might be derived from the friction being employed near the seat of the disease. The inconvenience of the pustular eruption he found might be avoided by previously shaving off the hairs. All acids during a mercurial course were forbidden, and even tea, if it became acid on the stomach. No vegetables except potatoes were to be eaten, and occasional aperients were administered, as it was found that a common *effect of the plan of treatment* was to induce constipation. Mr. Pearson

was in the habit of increasing the quantity of mercury used to one or two drachms, or even half an ounce. The salutary or specific and injurious effects he thus sums up :—

1. It may prove fatal by acting as a metallic salt, in which case it produces vomiting, fainting, diarrhœa, and dysentery. Where such symptoms arise, even if unattended with danger to life, the treatment will fail in its specific operation.

2. It may act as a mineral poison, not by its direct action upon the stomach, but by producing erethismus, inflammation of the joints, effusion into the bursæ, ill-conditioned ulcers, mortification of parts, and great debility. In all these cases the mercury acts as a mineral poison, affecting very much the mind and the constitution in general, and not producing its beneficial effects on syphilis.

3. Mercury often acts beneficially by promoting perspiration.

4. It promotes the urinous secretion, frequently rendering it turbid and offensive, and liable to deposit a white sediment.

5. It often produces inflammation of the glandular surface of the mouth, swelling of the tongue, and sponginess of the gums.

6. It promotes increased secretion of saliva, producing ptyalism.

7. It sometimes induces powerful depression of the animal functions.

The increased secretion from the skin, kidneys, and salivary glands, with depression of the animal spirits, were considered consistent with its operation as an antidote.

Mr. Pearson was of opinion that the gums should always be made tender and spongy, but this was only to be considered as an evidence of the action of the remedy, and as constituting no essential part of the process of cure. The plan of treatment was continued, if possible, until the symptoms had disappeared, and for some time afterwards, and this might occupy from seven to nine weeks.

I have been particular in giving an account of the action of mercury in Mr. Pearson's day, as, under the milder treatment now pursued, some of these results are seldom seen and little known. But another evil has crept in—namely, that patients who have been supposed to have undergone a mercurial course have done so very inefficiently; the gums have perhaps been "touched," the mercury has then been discontinued, and the disease has remained.—*Lancet, Aug.* 14, 1875, *p.* 237.

74.—ON SOFT CHANCRES IN THEIR RELATION TO SYPHILIS.

By JONATHAN HUTCHINSON, Esq., Senior Surgeon to the London Hospital.

Amongst the important practical questions which are connected with this subject we have chiefly—1st, At what period in the course of a chancre can a surgeon venture an opinion as to its nature? 2ndly, Are the characters of the two forms of chancre, soft and hard, often mixed? And 3rdly, Can a chancre which presented at one stage all the characters of a soft one subsequently become indurated? If I have made my meaning clear in what I have already said, you will be at no loss to find an answer to these questions. My position is that the soft sore results simply from pus-contagion, this pus being more or less peculiar, and its peculiarities being due to its having originated in syphilitic inflammation. I have insisted that this pus may or may not contain the germ-matter of syphilis. We are therefore much in the position of a farmer who sows in his field two seeds mixed together of very different rates of germinating power—clover and barley, for instance. The one which grows quickest is the one which first attracts attention, and it may be that one conceals the other. So it is if the fluid which conveys syphilis be an admixture of contagious pus and the specific germs of the true disease. The pus will irritate directly; the syphilitic germs need *their period of incubation.* Thus you will have first an inflamed pus-*secreting ulcer,* entirely free from induration. This may go through its

ınd heal, and then, at the end of a month, when the syphilis-incuba-
ɔd is past, you may find proof in the induration which comes on that
and wholly different kind of seed had been sown at the same time.
.ch the same as with the farmer when he cuts down his barley and
ıe clover growing at the bottom. I might carry this agricultural
ɣet further, and might remind you that if the barley has been par-
ɣ heavy, if it has been laid and matted, it may kill the clover alto-
It is just so when a contagion of mixed material occurs in syphilis.
ɔft sore is a very bad one—or perhaps I ought to use the reverse epi-
may altogether destroy the germs of the other poison which were
ed with it. Probably in this way many a soft sore does really pre-
ɜ development of a hard one. In practice, however, this happy re-
ıy no means universal, and it is a very common event to see a transi-
t sore followed by specific induration.
ıe here insist upon the extreme importance to the reputation of the
ɔner of the rule never to give an opinion as to the nature of a chan-
l the incubation period is over. Patients will come to you with
ntracted a few days or a week or two before, and will expect you to
to tell them whether or not they are likely to have syphilis. Now,
never anything in the conditions which are either present or absent
ɾill justify the most practised observer in giving any opinion at such
It is very rare indeed that an infecting sore acquires any induration
three weeks of the date of contagion, and more commonly it is a
ɔr five weeks. Until such induration takes place, nobody can tell
it is coming or not.
various indeed are the conditions which may have been present
the preceding period. Your patient may have had a soft sore, which
ve been severely inflamed, or even phagedænic ; he may have had a
ıd that bubo may have suppurated ; or he may have had no sore at
no bubo. Let your rule be, I repeat, to give to your patient no
whatever as to his chance of escape until he can assure you that it is
ıth since his last exposure to risk. It is a matter of constant experi-
be told by patients that the medical man first consulted assured
ɜt the sore was only a soft one, and would not infect; and, under such
tances, it is always very difficult to restore the patient's confidence
ɪviser's knowledge. If the contagion of syphilis were always effected
ɜ same care as to purity of the virus as is exercised in the case of se-
ɔf lymph for vaccination, it would not have been necessary to teach
trine of caution now. No one thinks of speaking as to the prospect of
ess of vaccination during the first few days, nor would he be able to do
ɜo soon as that were it not that the vaccine vesicle is enabled to de-
ɜelf uncomplicated by other morbid processes. It is not so, however,
ɔhilis, and hence the variety of the results which we witness during the
ɔ or three weeks after contagion. If the virus be introduced in a pure,
ɪt pure, state, then it is probable that in many cases the patient ex-
ɜs nothing excepting, perhaps for a few days, a little red pimple,
isappears, and leaves him, as he thinks, quite well for another three
r a month. At the end of that time the part begins to itch a little,
in becomes red, and gradually within a week or so a well-character-
uration is developed. If, however, the contagion have been effected
ɾture of contagious pus and specific virus, then you have a very dif-
ɔurse of things. Within the first few days the contaminated part may
sharply, and an ulcer may result which will probably send the patient
alarm to his surgeon. This sore is, of course, soft ; it secretes free-
its secretion may contaminate other parts, and you may have what are
nultiple soft chancres. You may inoculate it, if you wish, on the pa-
ɾin, and produce other similar sores, and thus prove that you have to
a non-specific secretion. But all this does not prove that the specific
s not there, and whatever may be the course of these soft sores,
easy to heal or obstinate, there remains the risk that the specific in-
ı may *ultimately be developed*. Probably the worse the sore, the
ɔ *inflammation, and the deeper* the ulceration, the greater is the pa-
ance that the specific virus may be thrown off ; whilst if the sore

heals in a few days the danger of true syphilis is considerable. We often, from patients who are the subjects of tertiary disease, hear the statement that the original sore healed in a week, and gave scarcely any trouble. Such cases are, I suspect, examples of the early healing of a conspicuous soft sore, which was followed some weeks later by an inconspicuous and unobserved hard one. Should the soft sore, however, be of protracted duration, it is, I suppose, possible that its characters may extend over the whole period of induration proper to the specific one. Under these circumstances the characters of the specific sore may be masked, and even good observers may never have been able to detect the characters of specificity in sores which yet proved infecting. At any rate, I am sure that you must be prepared to find that occasionally syphilis will follow from sores which you have had frequent opportunities of examining, and which from beginning to end you had thought to be soft and suppurative. If the sore should not only ulcerate, but become phagedænic, it is then usually quite impossible to diagnose induration ; yet, under such circumstances, secondary symptoms often, or indeed usually, follow.

If the argument which I have used be correct, it follows that whenever you detect induration you will be certain that constitutional syphilis will follow, but that, however sure you may be of the absence of induration, you can entertain no security unless a long period has elapsed. You will ask, naturally, If this be so, would it not be well, bearing in mind the very serious consequences which syphilis entails, to deal with all soft chancres as if they were infecting ones ? Candidly, my belief is that there would be great wisdom in adopting this rule, at any rate so far as local applications are concerned. In very many cases I have no doubt that the soft sore occurs exactly over the site of a coming induration ; and should your patient consult you within a reasonable period of the exposure to contagion, I cannot but think that it is good practice to destroy it by deep and free cauterisation, rather than to attempt merely to make it heal. Some of the published records of attempts at abortive cauterisation of chancres prove that it is not possible in all cases to prevent the subsequent development of induration ; but a few failures of this kind by no means make it certain that the practice would not be productive of good results in the long run. It might fail sometimes and it might succeed sometimes. It unfortunately happens that we should know when we failed, and should never know when we succeeded. It is very difficult, however, to believe that the progress of imbibition of the syphilitic virus is so rapid that there is no stage during which it exists only in the contaminated spot. How long this stage may be it is exceedingly difficult to tell, but for the present I cannot but think that it is wise to act as if it comprised the first week or ten days after inoculation. I have been alluding hitherto only to treatment with the object of utterly destroying by cauterisation the portion of tissue in which the poison is suspected to lurk ; but there remains the question as to how early we ought to attack the virus by its antidote. It is, I am glad to believe, becoming increasingly the rule of English practice to give mercury as soon as ever specific induration can be recognised ; but it is quite possible that we may, in the future, go further than this, and think that it is best to prescribe this remedy for all sores occurring within a month of contagion. We should no longer do so under the impression which formerly prevailed, that it was necessary in order to make the sore heal, for we now know that the soft sore is not syphilis, and cannot be influenced by its specific. The reason for giving it would be the fear that the patient may be passing unnoticed through the incubation stage of a true chancre. The soft sore proves that he has been contaminated with venereal pus, and shows that it is not improbable that he may have received the syphilitic virus also. It is quite possible that the antidotal efficacy of mercury may be much greater in the early stage than in the later ones. I wish, however, to have it distinctly understood for the present that I am merely suggesting, and not recommending. I am often pressed by patients to allow them to take mercury on speculation for soft sores, but hitherto have for the most part declined to do it ; my reason being, that until some proof has been afforded that we have to deal with true syphilis, we have no data by which to determine the requisite length of treatment.—*Lancet, Sept.* 25, 1875, p. 444.

MIDWIFERY,

AND THE DISEASES OF WOMEN AND CHILDREN.

ON THE EMPLOYMENT OF NITRIC ACID IN ULCERATIONS AND EROSIONS OF THE CERVIX UTERI.

r. James Braithwaite, Lecturer on Midwifery and Diseases of Women and Children at Leeds School of Medicine; Co-Editor of Braithwaite's "Retrospect of Medicine;" Assist-Surgeon to the Leeds Hospital for Women and Children.

ases of ulceration or erosion of the os uteri, with or without endo-cervi-, are so common, and in hospital practice so numerous, that some more ient and less troublesome caustic than nitrate of silver is urgently led for their treatment. I have carefully and fully tried the action of most stics (including carbolic acid), and found none to answer the purpose so l as nitric acid. The great fault of nitrate of silver is the fugitive nature its action; its influence seldom extends beyond five or six days, even n rubbed upon and held in contact with the parts. It is more a stimu- t than a caustic, as it produces no slough, and causes extreme turgescence he capillaries immediately below the surface influenced, as evidenced by occurrence of hemorrhage, often sufficient to obscure the parts before it been removed from contact with them. At the second examination we n find the ulceration or erosion little if at all altered in appearance. This ect must be atoned for by the frequent reapplication of the remedy, essitating each time the use of the speculum. I believe in this evil really the source of the opinion held by some eminent men, that these diseases uire little or no local treatment, for our opinions are often unconsciously luenced by our wishes. Nitric acid, on the other hand, is a really efficient stic, producing a slough which is peculiarly firmly adherent, and which sequently necessitates a healthy effort by the subjacent parts for its sep- tion. The only other caustic which produces a slough of the same char- er is nitrate of mercury. Nitric acid moreover requires no special prepa- ion; it does not spread like potassa c. calce, nor is its action so deep; it oduces little or no pain and no hemorrhage. These advantages are trivial mpared with the fact, that when once it has been properly applied, in ny cases no further interference is necessary, and thus the frequent use of e speculum may be done away with. When the second examination is de, it should be after the lapse of a month, and it will then sometimes found that there is a small spot requiring a fresh application of the acid, t often the sore appears to be quite healed or to be healing satisfactorily. e fresh mucous membrane which forms is not cicatricial in appearance, and hen healing is going on satisfactorily, it has a sharply defined edge, and ing of a pale rose colour, contrasts strongly with the bright red of the sore. he contraction is greater than follows the use of any other caustic; but is is a great advantage, for on account of the relaxed state of the tissues, it just what is required to insure the permanence of the cure.

The acid is best applied by means of a small and tightly rolled piece of otton wool, which is to be placed by an ordinary speculum forceps in con- ct with successive portions of the surface until the whole is covered with a hite eschar. In a case of chronic endo-cervicitis, the acid should be ap- lied to the interior of the open cervical canal, and if it is not open the case not one suitable *for the* treatment. The contraction which accompanies

healing is only to a healthy and natural degree. Provided the caustic has been used with ordinary prudence, I have never seen anything but good follow its use, and the case with which a chronic case of cervical catarrh, with ulceration or erosion, may be cured by it is something marvellous. The bulk of my cases have been hospital out-patients, and the comfort the use of nitric acid has been in their treatment is very great, both in certainty of result and in saving my own time. Without local treatment very little can be done for these patients, for hygienic treatment is generally impossible, and medicinal treatment alone is useless. I shall not take up your space by details of cases, although I have copious notes of about forty. By trial of the remedy a proper estimate of its value will soon be formed.

The use of nitric acid as a caustic is so familiar to us all, especially in the treatment of some diseases of the rectum, that I had some hesitation in bringing the subject before you, and should not have done so but that I believe it is only used by two or three medical men engaged in the treatment of diseases of women. It is mentioned incidentally at the conclusion of a paper by Dr. Lombe Atthill, upon its application to the interior of the uterine cavity, that he uses it habitually in the diseases in question ; and Dr. Roe, of Dublin, in an analysis of 164 cases of uterine disease, relates a case of extensive ulceration in which he employed it. Mr. Robert Ellis has recommended the use of a saturated solution of nitrate of silver in nitric acid, and I believe Dr. Bennett has mentioned it also; but these writers are exceptions to the general rule. It is not mentioned by Tilt in his admirable work on uterine therapeutics, nor by any other of our standard authors upon diseases of women, all of whom recommend nitrate of silver, or mention its use as the usual practice.—*Obstetrical Journal, Nov.* 1875, *p.* 504.

76.—A NOVEL TREATMENT OF OBSTINATE VOMITING IN PREGNANCY.

By Dr. Edward Copeman, Senior Physician to the Norfolk and Norwich Hospital, President of the British Medical Association.

[The following paper contains the account of three cases, which if further corroborated may open a wide field of usefulness in the treatment of a very obstinate, rebellious, and sometimes fatal form of sympathetic disorder.]

During a long professional life I have had much experience of this troublesome affection, and amongst medicines have found calumba and oxalate of cerium the most beneficial; but these and all other medicines often fail, and the treatment suggested by the following cases, discovered by accident as it were, and never, as far as I know (although nothing is new under the sun), employed before, promises some chance of our being able with more certainty to overcome this very threatening concomitant of pregnancy.

On June 9th, 1874, I was summoned to a lady, thirty-five years of age or thereabouts, to consult with two other practitioners already in attendance. She was about six months gone in pregnancy, and was so reduced by almost incessant vomiting that great fears were entertained as to her safety. I noticed there was slight uterine action accompanying the sickness, and, on examination, I found the os uteri partially dilated so as readily to admit the finger. I thought it right under the emergency to advise bringing on labour without delay ; the gentlemen present, however, expressed no little apprehension as to whether or not she would have strength to undergo the effort of parturition on account of the very depressed and exhausted state of her system. They nevertheless concurred in the advisability of the course I recommended, and asked me to perform the operation. I at once dilated the os uteri as much as I could with the finger, and could feel the membranes and the head of the child. I tried to rupture the membranes with a telescopic *female catheter (the* only instrument at hand), but they were so flaccid and *the head offered so* little resistance, the catheter shortening itself also on my

making pressure, that I could not succeed; and, thinking it wise to wait awhile before resorting to any other expedient, we retired to another room for further consultation. In about an hour, we saw the patient again, and were surprised to find that a longer period had elapsed without sickness than before; and we again waited, in the hope that she might be able to take a little nourishment, and so be better prepared to undergo any further proceeding. We waited another hour, and another, but there was no return of vomiting; and we spent the rest of the night in watching, during the whole of which time she was improving, and we determined to let well alone. I left her early in the morning, and had a favourable account of her a few days afterwards. There was no return of sickness; she went on to the full period of pregnancy, was then delivered of a healthy child, and made a good recovery.

This case made a strong impression on my mind; and I wondered whether the relief to the vomiting, so urgent and threatening to her life, could have been effected by my having dilated the os uteri, and thus removed any undue tension that might be producing sympathetic irritation. It was not very long before I was called some distance in the country to consult about another case of vomiting during pregnancy of great urgency, occurring about the second month. The surgeon in attendance had adopted the best acknowledged medical treatment, and had arrived at the conclusion that artificial delivery would be necessary to save her life. With the full recollection of the former case, I examined the uterus, and found some degree of anteversion, and the os patent enough to admit the end of my finger. I forthwith dilated it as much as I could, passing my finger all round, removing all puckering and making a smooth edge. She vomited only once slightly after this proceeding, and we left her with the understanding that, if the sickness continued, I should be summoned again in a few days to bring on abortion. This summons never came; but in about a fortnight I had a letter from the husband, stating that his wife began to get better an hour or two after I left, and that the sickness had entirely ceased. I have heard several times since that the patient is going on remarkably well, and I believe she expects to be confined some time this month.

A third opportunity has since offered itself for a trial of this novel (as far as I know) treatment. On the 6th of this month (April 1875), I saw, in consultation with a very intelligent country practitioner, a lady in delicate health just entering the eighth month of pregnancy. She was the mother of nine or ten children, and her life was valuable. Generally during early pregnancy, and sometimes for several months together, she had been troubled with vomiting; but during the last three weeks, the sickness had been almost incessant; she could keep nothing down, and was in a very feeble and emaciated condition. She had moreover a considerable amount of albumen and some pus in the urine, a few casts also; and fears were entertained of there being extensive kidney-disease. There was, however, no dropsy, and our opinion was somewhat modified by the knowledge that the urine does often, during pregnancy in the latter months, contain a good deal of albumen. The patient was so ill, that she would willingly have consented to artificial delivery, if really necessary. I examined the uterus, and, as in the other cases, found it patent, puckered, and dilatable, and I dilated it as much as I could with my finger in the hope that the sickness might cease after such a proceeding. I should say that the usual remedies had been carefully employed without producing the desired effect. A few days after my visit, her husband called upon me to say that his wife had no return of sickness after I left, and was now able to take food without inconvenience, although he still thought her very weak and ill, and feared she would not recover.

On the 23rd, I received a very satisfactory letter from the surgeon in attendance to the following effect. "I am exceedingly glad to tell you that Mrs. —— was confined yesterday. I should think it is not more than an eight months' child, still it looks healthy and strong. You may most certainly add her case to the others you related to me. *There was never any urgent sickness after you dilated the os uteri*, and the last week Mrs. —— has re-

quently taken with relish and no inconvenience solid food, such as boile[illegible] mutton, with asparagus, and drank home-brewed beer. This morning sh[illegible] was going on quite well; she was not even faint or at all exhausted aft[illegible] her labour. I am very glad I called you in, for I now know how to proce[illegible] with cases of sickness in pregnancy. Should I meet with any more patien[illegible] I will either ask you kindly to meet me again, or report them to you."

This subject appears to me of so much importance, that I send my case for publication without waiting for further experience or attempting to explain the *modus operandi* of the treatment suggested. It is my intention to communicate further on the matter when I have more thoroughly digested it myself; and I will not fail to report any future success or failure that may come under my observation. I trust, moreover, that others who may be induced to pursue the same plan of treatment will report their experience for the guidance and instruction of the profession.—*British Medical Journal, May* 15, 1875, *p.* 637.

77.—A NOVEL TREATMENT OF OBSTINATE VOMITING IN PREGNANCY.

By Dr. JABEZ THOMAS, Swansea.

On December 21st, 1868, I was called to see the wife of Captain M., who had just returned from a sea voyage around Cape Horn; she was thirty-two years of age, and seven months gone in her fourth pregnancy, naturally strong and robust, but now much reduced by incessant vomiting. The usual remedies—hydrocyanic acid, soda and calumba, and the nitrate of cerium—were prescribed for a few days to allay the gastric irritation, without the least effect, and not the smallest quantity of nourishment (such as milk and lime-water) could be retained. On the 24th, her condition became so precarious, that I suggested premature delivery; and, on consultation with another practitioner, this view being concurred in by the gentleman called in, I proceeded to the induction of premature labour by means of Barnes's bags, having first dilated the os as much as possible by the finger. When I saw her the same day, I found her condition much improved, having retained the medicine and some nourishment; I, therefore, removed the bag, and refrained from further interference for the present. About 5 a.m. on the following morning, I was sent for in a great hurry, and found she had been delivered by spontaneous expulsion of a male child, which only survived a short time. On inquiry, I found she had slept tolerably well during the night, and was aroused from her sleep by a slight pain, and found that the child was born immediately afterwards. She made a rapid recovery, and was out of bed in about a fortnight. I was struck at the time at the sudden cessation of the vomiting and her general improvement, which I attributed at the time to the means employed to allay the gastric irritation; but I am now led to think with Dr. Copeman, that probably the urgent symptoms were due to undue tension, and that the introduction of the bags into the os uteri may have been the immediate cause of relief. It is certain that, after the introduction of the bag, there was little or no vomiting. I am led to think that this was a case of vomiting due entirely to the pregnant state, and not to the combined effects of sea-sickness and the vomiting of pregnancy, from the fact, that this lady had been in the habit of going to sea with her husband, and was never much troubled with sea-sickness, and was subsequently confined at sea of a healthy child about a week before her arrival at Antwerp, the vessel having been longer on her passage than was expected; both mother and child did well. In conclusion I would remark that I have found the nitrate of cerium (as recommended by the late Sir J. Simpson) most beneficial in the vomiting of pregnancy.—*British Medical Journal, May* 29, 1875, *p.* 707.

78.—THE RELATION OF THE DISCHARGE OF OVA TO THE PERIOD OF MENSTRUATION.

The interesting question of the relation of the discharge of ova to the period of menstruation has recently been the subject of a paper by Dr. John Williams, of University College Hospital, which has been read before the Royal Society. It was not till a comparatively recent period that the connexion between menstruation and the discharge of ova was ascertained, and we owe to M. Coste the determination of the fact, that though the rupture of a Graafian follicle is usually synchronous with the epoch of menstruation, the coincidence in point of time between the two is not absolute; for cases are on record where menstruation has occurred, yet in which the minutest investigation has failed to discover the presence of a ruptured sac. Nevertheless, in the great majority of cases there can be no doubt that the escape of an ovum from the ovary and the discharge of blood from the uterus are associated events. The point that Dr. Williams has endeavoured to determine is, at what period in the course of the month the separation of the ovum takes place. He has had the opportunity of examining a series of cases, in all of which the period of menstruation was known. In some of these a Graafian follicle had been matured and had actually ruptured. In others, a Graafian follicle had been matured, and hemorrhage had taken place into the cavity, but no actual rupture had occurred. In one case a Graafian follicle had matured, but neither rupture nor hemorrhage had actually occurred; and, lastly, in three cases no Graafian follicle had become enlarged to the size exhibited by it at maturity. From his observations, Dr. Williams has come to the conclusion that, in the great majority of cases, the discharge of ova takes place *before* the appearance of the menstrual flow with which it is connected; for in ten out of fourteen cases rupture of a follicle or hemorrhage into its cavity had occurred before the return of the catamenia; in one it was doubtful whether rupture of a follicle or the appearance of the discharge would have taken place first; in two a menstural period had passed without the maturation of a follicle; and in one a periodical discharge was imminent, though the ovaries contained no mature Graafian follicle. It is not improbable, he thinks, that the follicles which were found in the last three cases, and which were enlarged to the size of a small pea, would have become matured by the next return of the flow. An interesting point was long ago made out by Coste, that in rabbits the excitement of the act of intercourse. and even of the desire to copulate, makes a difference in the period at which the Graafian follicles rupture, since when two sets of these animals were examined, one of which had been allowed access to the male and were taken away before connexion, whilst others were not allowed to see the male, the follicles, when the animals were killed, ten or twelve hours after, were ruptured in the former and unruptured in the latter.—*Lancet, Oct.* 23, 1875, *p.* 605.

79.—ON THE PERIODICAL RENEWAL OF THE MUCOUS MEMBRANE OF THE UTERUS.

By Dr. JOHN WILLIAMS, Assistant Obstetric Physician to University College Hospital.

The numbers of the Obstetrical Journal for February and March contain an account by Dr. Williams of some very carefully conducted investigations into the minute anatomy of the mucous membrane of the uterus, with special reference to the changes which are coincident with the phenomena of menstruation.

Until quite lately, menstruation was generally thought to be due to a periodic congestion of the uterus—a form of erection—and that during the interval the organ was in a passive state. More recent observers have shown that the period of uterine activity occupies a longer time than had been previously

supposed; they believe that the organ is in an active state of preparation for some time before the actual flow appears, and that another interval elapses after its cessation before the organ returns to a state of rest. Dr. Williams shows, however, that there is no period of rest, that the menstrual flow is only the terminal phenomenon of a cycle of changes which require for their completion the whole intermenstrual period. He gives a detailed account of these changes, as shown by a careful examination of the uteri of twelve women who had died at different known stages of the menstrual or intermenstrual period. Starting from a time just antecedent to the appearance of the menstrual flow, the cycle of changes shown by these twelve specimens is briefly as follows.

1. Acute fatty degeneration of the uterine mucous membrane; this is well marked before any extravasation of blood appears. It begins just inside the internal os, and extends upwards.

2. Beneath this degenerating membrane the subjacent muscular wall is congested, and covered with a layer of actively proliferating cells—the first step towards a formation of a new lining membrane.

3. The hemorrhage next appears; Dr. Williams believes that this is partly due to the fatty change in the mucous membrane and the active congestion of the subjacent tissue, and partly to muscular contraction of the uterus itself. He finds that the cavity of the organ when menstruation is over, though larger than usual, is smaller than it would be after removal of its lining membrane had not contraction taken place. He found also that, in specimens examined during the flow, the muscular wall was firm and pale, while the peritoneum and broad ligaments were congested. He thinks, therefore, that the contraction of the uterus drives the blood from the muscular wall into the mucous and serous membranes; the contents of the glands and the greater part of their lining epithelium are expelled at the same time.

4. When hemorrhage has taken place into the degenerated membrane, it undergoes rapid and complete disintegration; in some cases it is entirely removed in three or four days, in others the process occupies seven or eight days.

5. During all this time cell-formation proceeds actively in the subjacent layer; three days after the cessation of the catamenia the lower two-thirds, and at the end of a week the whole, of the body of the uterus is lined with a thin mucous membrane, covered by a fresh growth of columnar epithelium. It is, however, at first of a very rudimentary character, and it is not till just before the period of the next flux that the membrane becomes structurally perfect. If impregnation now occur, it undergoes further development, but failing this, the same series of changes again commences. Menstruation is, therefore, due neither to congestion nor to a species of erection, but to a molecular disintegration of the mucous membrane of the body of the uterus, accompanied by hemorrhage. The paper is illustrated by some beautifully executed drawings, showing the microscopical appearance of the uterine mucous membrane at different stages of this physiological process.—*London Medical Record, April* 21, 1875, *p.* 247.

80.—ON NEURALGIC DYSMENORRHEA.

By Dr. Charles R. Drysdale.

The author thought that a salutary revolution was now setting in against the surgical doctrines held by Dr. Marion Sims and others upon dysmenorrhea and its causes. Dr. Drysdale very rarely indeed witnessed any case where he had found any service to arise from operations or the uterus; whilst he had seen some cases of pelvic abscess and pelvic peritonitis occur from such interference. He was lately consulted by a patient, single, aged thirty-two, who had suffered since the age of sixteen from dysmenorrhea, and who, on consulting two eminent specialists, was advised by the one to

ecourse to incision of the cervix, and by the other to wear a pessary. case, the uterine sound passed in its normal direction without diffi- and the patient had no leucorrhea nor prolapse of the organ, which ite normal in size. There was no ulceration of the os uteri, although : eminent specialist had considered this as the cause of her dysmenor- The author held that there was still too great a tendency to expect to evident physical cause for all painful menstruation. Spasm and neu- vere quite sufficient to account for the vast majority of cases. Mem- s shreds, also, were frequent causes of obstruction to the monthly flow. strative case was recorded. The rational treatment of dysmenorrhea ncing at an early period, consisted not in the use of pessaries, or of in- of the uterus, surely; but in the use of cold baths in the morning, ort walks in the open air afterwards; in hot baths, a few days pre- to the menstrual periods; and in palliative treatment of the paroxysms ns of antispasmodics at the epoch of pain. Marriage sometimes cured ses at once; at other times, it was of no use.—*Obstetrical Journal*, 75, *p.* 475.

N THE POSTURAL TREATMENT OF PROLAPSUS OF THE FUNIS UMBILICALIS.

HN BRUNTON, M.A., Medical Officer to the Great Northern Railway Company, and Surgeon-Accoucheur to the Royal Maternity Charity.

ipse of the funis is an accident which, while it produces comparatively ger to the life of the mother, is exceedingly hazardous to that of the

e great majority of cases, if the prolapse is permitted to continue till ivery of the child is accomplished by the natural efforts of the mother, f the child results,—the cause of death being obviously from pressure obstructs the fetal circulation, "as surely as if breathing were pre- after birth."

sionally we meet with cases in which, the funis being prolapsed, de- akes place, and the child is born alive; these cases, rare as they are, n women who have large pelves, with soft and dilatable parts, and in he delivery is very rapid. But in the greater number of cases death to follow, if we do not protect the funis from pressure, or deliver the ith a measure of rapidity,—in other words, subject the cord to pres- : as short a time as possible.

e enumerate, as briefly as possible, the various causes of prolapse as set y various authors on obstetrics:—

n excessive amount of liquor amnii, the child being of the ordinary

ne same cause, with a small child.

wide pelvis, with ordinary sized child.

wide pelvis, with small child, and with this, the presence of twins.

alposition of the fetus, as shoulder or arm presentation, which does mit the circular os uteri at all points to closely embrace the present- t, on account of its irregularities.

efficient action of the lower segment of the uterus, for "the uterus is f means by which the cord is prevented from falling down between senting part of the child and the passages, from the closeness with ts inferior portion encircles it; without this, from the erect posture of man female, there would be a liability to prolapsus of the arm or cord r labour." (Rigby.)

or a similar reason to that of malposition, a narrow pelvic brim—the apt to float down with the escaping liq. amnii.

osition of the placenta near the os, and therefore low insertion of the

ngth of cord; if very long. (I have seen it sixty-three inches.)

10. Dropsy of the cord, and therefore excessive weight of it.

These are the principal predisposing causes. The usual exciting ones are—

1. Sudden large gush of liquor amnii, when rising to the erect posture.

2. Early rupture of the membranes when the child is small, premature, or malpresenting.

It is not necessary to say anything about the *diagnosis* of prolapsed funis, for it is easy; and as to *prognosis*, we all know from the multitude of cases detailed by obstetric authors, and the anatomical relations of the parts concerned, that it is very serious as regards the child.

As to treatment, all authors are agreed, that if the funis presents with the membranes unruptured, it is wise and prudent to let it alone; for it is obvious that while the waters are retained, but slight (if any) pressure can be exerted on the funis. At all events, it is hardly possible for the child to be destroyed by the compression in such circumstances.

But if the liquor amnii has escaped and a loop of funis presents, what is to be done?

We must either protect the funis from compression until natural delivery occurs, or relieve it from pressure as speedily as possible.

Now what are the available resources for such procedure?

I. Drs. Smellie, Gooch, Denman, Hamilton, Dewees, Burns, Campbell, and a host of authors recommend version, and show an amount of success, provided the membranes have not been ruptured and the parts are dilatable. Indeed, Mauriceau, in thirty-three cases recorded, turned nineteen times and lost only one child; but in this case there was an arm presentation requiring version. Many others have been very successful in a similar way.

It is true that by version delivery is usually completed very rapidly, and in a much shorter time than it would be otherwise. This is an advantage certainly, but the risk at the same time is great, for every one knows the large percentage of infant deaths in breech and footling (natural) cases as well as after the operation of version. There is not a complete protection of the cord from pressure. There exists a considerable amount of danger to the child. How often have we been disappointed in version and in breech and footling cases, when the body of the child has been delivered, the pressure of the head upon the cord has been fatal to the child, and this especially in *first* cases, where if I mistake not, the mortality is as high—two in three.

But it is curious to note how Dr. Denman qualifies his recommendation to turn in prolapse, he says, "no attempts to save the child are on any account to be made, but such as can be practised without the chance of injuring the mother."

Now we come to the gist of this question—viz., treatment by version. It is advised *before* the membranes have been ruptured; at this period there is little or no danger to the cord. But if the membranes have been ruptured, and the liquor amnii has drained away, with the uterus firmly clasped round the fetus, and the cord in the vagina, is turning advisable? is it safe? or is it safer than other means? or are other means safer than turning? Every one of us who has any experience, knows what risk the mother runs in the operation of version in such circumstances; and every accoucheur who has practised the operation, understands the difficulties to himself, the pain and the unpleasantness; certainly chloroform is an aid of great value, but one has not it always at hand, or does not feel justified in administering it. At the same time is the risk to the child lessened? For my part I think the risks are increased both ways, for the very introduction of the hand, which must, according to Dr. Rigby, be "done with the greatest possible caution," adds to the pressure on the cord, and the very operation of changing the axis of the child, and the withdrawal of the operator's hand, with the foot, subjects the prolapsed cord to additional risk; while to crown the whole, we have yet to resign the cord to the pressure that accompanies the delivery of the body and head.

Dr. Merriman lays down certain conditions in which it is, in his opinion, *justifiable to turn.* These are supported by Dr. Ramsbotham—viz., when *pulsation exists in the cord*, the head not having yet entered the pelvic brim;

when the pains are not strong, and the soft parts are relaxed and dilatable. Though it is not possible to lay down an exact rule for every case, each should be judged of on its own merits, and the accoucheur is bound to use due deliberation and caution; not a deliberation of such a hesitating character, as to allow sufficient time to pass, for the pressure on the cord to jeopardize the infant or prove fatal to it.

On the whole, whether the membranes are ruptured or not, my opinion is against version, because I shall show that we possess a much more reliable means of treatment, in every sense of the word, safe for the infant, and safe for the mother. If we have these means, it is our bounden duty to employ them. While in the great majority of cases version is, as a means of treatment, to be excluded, still, we might find it on some rare occasion useful, and it is not to be forgotten it was successful in the hands of Mauriceau. Obviously in complex presentations with the funis, it is the only method to be employed—such as, arm with funis, *placenta prævia* and funis.

The question of version, and the unavoidable pressure on the funis, suggests a most important question, which has a very strong bearing on all the methods of treatment—viz., How long is compression of the cord necessary to cause the death of the fetus? I have searched a number of obstetric works, and in only one—viz., Dr. Alex. Hamilton's, of Edinburgh (1784), have I found a time mentioned; he says, "a pressure on the umbilical cord perhaps for ten minutes, by interrupting the circulation, will be sufficient to destroy the life of the child."

This time seems far too long, for I am sure in our experience in versions, for example, two minutes' pressure, from non-delivery of the head, has been quite sufficient to destroy the life of the fetus. Notwithstanding there are cases on record and to be met with, where the prolapsed cord has apparently ceased to pulsate, and yet the child has been delivered in time for its resuscitation. Dr. Tyler Smith especially notices this fact. He says, "cases are on record in which the cord, being pressed upon from above, the loop hanging down is pulseless from pressure on the arteries, but the heart may beat for a considerable time after this, and the child be ultimately born alive." These cases unfortunately are rare. Sometimes change of posture of the cord allows the otherwise feeble heart to rally, and the pulsation of the cord is restored.

II. We now come to the next position. The membranes have been ruptured, the cord prolapsed, and the head is fairly engaged in the cavity of the pelvis. If the os is fully dilated turning is out of the question, or at least not much in it. What is to be done? Most authors, from early days, recommend the application of the forceps to complete rapid delivery. Many lives have been saved in this way. Care must be taken not to enclose the loop of cord within the blades of the forceps. "The extraction must be as rapid as is consistent with the mother's safety."

It is obvious that in primiparous cases delivery cannot be effected with sufficient rapidity without great danger to the maternal parts. Also, as a great many cases of prolapse are in first labours, the applicability of the forceps must be limited for the above reason. What may be the exact proportion of prolapses in *primiparæ* I have not been able to ascertain; in my own limited experience, afterwards to be related, two out of five were such; elsewhere I found three in twelve.

Admitting the advantage of the forceps in certain conditions, have we any better means of overcoming the difficulty? When called to attend a labour we have not always a bag of instruments with us. Should prolapse occur, the delay which follows before procuring the instruments would be fatal to the child. But more anon.

III. The next method of treatment is that of reposition of the cord into the uterus, or if that cannot be done, to place the prolapsed cord in such a position that it shall be pressed upon as little as possible.

(*a*) This process was recommended by Dr. Merriman. The cord is to be brought into the oblique diameter of the pelvis, opposite to that occupied by the child. This *procedure is said to* be successful sometimes in *pluriparæ, with large pelves and soft dilatable* parts. Nevertheless, it is plain from the

change that occurs in the position of the head during the progress of labour, that while the cord so placed may at one time be free from pressure, it is shortly subjected to it again and hazard arises. In *primiparæ* such measures are of little or no avail. (*b*) Some recommend the pushing of the cord up in order to hook it over the chin. "No doubt," says Dr. Tyler Smith, "this answers the purpose if the cord will keep there." (*c*) Dr. Ramsbotham advises us to carry the loop up above the presenting part, and retain it there till the next pain comes on, *in the hope* that the head will be propelled somewhat downwards, while the funis remains above. But he remarks, "we shall often be disappointed by the loop reappearing as soon as we remove our fingers." Is not this the experience of all of us? (*d*) Next it is recommended to push up the loop and apply a piece of sponge or soft linen, "to act as a stay on which the loop may rest." This process has succeeded now and again. But is it certain? By no means. (*e*) Dr. Mackenzie enclosed the prolapsed cord in a leathern purse, and carried it up into the uterus. The operation is, however, difficult, and one now rarely if ever attempted. (*f*) Dr. Michælis of Kiel, suggested and used a gum elastic male catheter, to which he attached, by ligature, the loop of cord, passed the catheter and funis up into the uterus, withdrew the stilette, and allowed the catheter to remain during labour, being soft it did no harm. He has since abandoned this process for the use of the fingers. Of other mechanical means, some of which are ingenious enough but complicated, I need only mention that introduced by Mr. Perkins, of Exeter, in 1843. (*g*) It is described by Dr. Ramsbotham, in his treatise on Obstetric Medicine and Surgery.

The danger that arises in the employment of the mechanical contrivances is due to the ligature; the cord is very slippery, and necessitates some compression to retain it in Mackenzie's bag, to attach it to Michælis' catheter, as well as to Perkins' whalebone; at the same time there is another danger in the last procedure—viz., in withdrawing the tape, which must necessarily be wet, an amount of friction ensues which obstructs the ready passage of the tape and compresses the cord. I would suggest that it might be well to grease the tape before use, if this method be had recourse to by any one.

Dr. Ramsbotham says that we can easily get, on the spur of the moment, a piece of whalebone, "wherever women are present." I presume he means a piece from an attendant's corset; but, in these days of steel corsets, I am afraid there would be great difficulty in getting the whalebone.

I said that we had not always the forceps with us; neither is it likely that we can always carry an instrument designed for reduction of prolapsed funis, seeing that the accident is so rare (1 in every 276 cases). Have we any other means available?

IV. I alluded above to the unsatisfactory result of simply reducing the cord by the hand. Yet the hand is the best and readiest instrument, and always available. I also hope to show that no other instrument is necessary for successful reduction of the cord.

Sir Richard Croft advises us to carry up the loop of cord, and suspend it over one of the limbs of the child. He was successful in a few cases. The difficulty of accomplishing the object, as well as the risk to the mother in introducing the hand into the uterus, detracts very much from the value of this operation. Indeed, having introduced the hand into the uterine cavity, one might as well go on to complete version.

Before proceeding to describe the methods which, when understood, will claim precedence of all others, I may mention that it is quite unnecessary to operate upon the cord, provided the cord be long lapsed, cold, and pulseless; it is then advisable to let the case terminate naturally, if the presentation is natural. Other measures of course are to be taken according to circumstances.

Notwithstanding, as I have mentioned above, there are cases in which it is advisable to reduce the cord, though it be apparently pulseless, if the prolapse is of short duration and the fetal heart can be heard "per abdomen" *still beating, if the* pressure can be taken off the cord, the circulation may *be restored and the* child saved.

Indeed, in spite of what I have said above, it is justifiable to reduce the cord in all cases, if there be no risk to the mother, in the hope of saving the child.

It is very interesting in following out the various methods that have been suggested for reduction of the prolapsed funis, to notice that at intervals some approach has been made towards that process which I am now going to advocate as the best, the safest, and most sure—*the postural method.*

In 1784, Professor Alexander Hamilton, of Edinburgh, says, "the best practice, therefore, is to take the earliest opportunity that the circumstances of the case will admit of, to reduce the cord *by placing the woman in a proper position*, so that the hand of the operator may be carried up, *in the absence of pain*, into the pelvis, and the cord entirely reduced."

Unfortunately, there is no mention made by him of the *proper position;* and so we are left in the dark as to his exact meaning and mode of procedure.

Next, Drs. Hardy and M'Clintock approach the true postural method very nearly. They advise, that in attempting manual reduction, the woman should lie upon the side opposite to that on which the cord protrudes—*i.e.*, if the cord be felt on the right side of the pelvis, the woman should lie on her left side, and *vice versa*. By this means a certain amount of backwards and downwards (with reference to the mother's position in bed) inclination is given to the cord, and it may slip up and be retained.

If the cord slip out anteriorly, there is little or no chance of its being retained *in situ* when the mother is placed on her back. But take the opposite position to this; let the cord slip out posteriorly, reverse the mother's position—let her be placed on her knees with her head low down on a pillow, "after the manner of eastern worshippers," and the difficulty can be easily overcome.

It is somewhat astonishing how near one may approach the desired end and yet not reach it. Not until Dr. Thomas, of New York, read his paper on postural treatment of prolapsed funis has the desired end been achieved (1858).

Dr. Thomas thus describes the history of the operation, and the manner in which it is performed:—"In a course of lectures," he says, "on obstetrics, delivered by me in the University Medical College of this city, about two years ago, I closely investigated this subject, and came to the following conclusions:—*First*, That the causes of the persistence of this accident (whatever may have at first produced it) reduced themselves to two—the slippery nature of the displaced part, and the inclined plane offered it by the uterus, by which to roll out of its cavity; and, *Second*, That the only rational mode of treatment would be inverting this plane, and thus turning to our advantage not only it, but the lubricity of the cord, which ordinarily constitutes the main barrier to our success. This, I found, could be readily accomplished by *placing the woman on her knees, with her head down upon the bed*, in the posture assumed by eastern nations in worship, and now often resorted to in surgical operations upon the uterus and vagina. Let it be remembered that the axis of the uterus is a line running from the umbilicus, or a little above it, to the coccyx; and it will be seen that, by placing the woman in this position, it will be entirely inverted."

Advantage here is taken of the (*a*) Slippery nature of the cord; (*b*) The action of gravitation; and (*c*) The peculiar way in which the lower segment of the uterus contracts when a pain is coming on—viz., by commencing the contraction in the neck, and gradually passing upwards, so that when the cord is pushed up by the hand just as contraction is coming on, the very action of the cervix itself, so to speak, sucks back the cord that had been prolapsed, and by the closeness of its contraction prevents the cord from falling down again between the presenting part of the child and the passages.

Before appending cases treated by the "postural method," I may mention that in some cases where the knee-elbow position cannot be had recourse to, we can substitute a modification of Drs. Hardy and M'Clintock's process. Taking advantage of their suggestion—viz., of placing the mother on the side opposite to that on which the funis has prolapsed—we can add greatly

by elevating the mother's pelvis by putting pillows under her, and lowering her head and shoulders. It is quite obvious that, in the case of a stout, thick-set, apoplectic-looking woman, the postural method might be fraught with some danger.

I now subjoin some cases:—

Case 1.—On July 12th, 1868, at half-past 11 p.m., I was called to attend Mrs. K. in her fourth confinement. Labour had set in slowly about midday, and gradually increased in severity. On my arrival the pains were active; the vertex was presenting; no liquor amnii had escaped. In a quarter of an hour a male child was born naturally, and separated in the usual way. Having noticed that the mother's abdomen was very large, and that no liquor amnii had escaped with the child, I suspected twins; and, on examination, detected a second child, with the head presenting, the membranes entire. The os uteri being well dilated, I ruptured the membranes, when a gush of liquor amnii took place. On examination, I now found a large loop of a second funis prolapsed. As it was necessarily under severe pressure during each pain, I resolved to try reduction of the cord by the *postural method*. Placing the mother on her knees, with her face resting on a pillow, I passed my hand into the vagina, pushed up the prolapsed loop of cord, and waited till the uterus contracted. I then had the satisfaction of finding that the cord did not come down again; and *in a few minutes* a live female child was born. I may mention that I reduced the cord once or twice before trying the postural method, but it prolapsed with each pain.

Case 2. On October 26th, 1869, I was called to attend Mrs. H., aged twenty-seven, primipara. She had been ill ten hours. Pains active; occurring every few minutes. On examination, I found the os uteri dilated to the size of a crown piece, the head presenting, a bag of membranes protruding, and in this bag was a loop of funis. Finding no pulsation in the cord, I thought it proper to at once reduce it, in the hope of saving the child. Placing the patient in the knee-elbow posture, with little difficulty I partly introduced my left hand into the vagina, ruptured the membranes, and just as a pain was coming on, pushed up the loop of cord (six inches in length) alongside of the head, and, as the uterus contracted and the head was forced down, the cord slipped out of reach, and was not again prolapsed. I did not keep the mother two minutes on her knees. She had a tedious labour, with a narrow pelvic outlet, and was delivered by forceps some hours after. The child was dead. There was extensive disease of the placenta—calcareous and fibrous. The mother said she had not felt fetal movements for some days. The mother made a good recovery.—*Obstetrical Journal, April* 1875, *p.* 16.

82.—ON RETROVERSION OF THE GRAVID UTERUS.

By Dr. Lombe Atthill, Obstetric Physician to the Adelaide Hospital, Dublin.

Retroversion of the uterus is not, at least in its complete form, a displacement of frequent occurrence; doubtless partial retroversion, by which is to be understood that condition in which the fundus inclines more or less backwards, the whole organ lying in a sloping direction across the pelvis, the os being still, however, its lowest point, is not very rare; but this partial version of the womb seldom gives rise to distressing symptoms, and consequently, as a rule, escapes notice. But true, complete retroversion is of infrequent occurrence. But although this displacement is comparatively rare, still it is an affection of great importance, not only from the gravity of the symptoms it gives rise to, and the serious and even fatal consequences which may result from its occurrence, but also because of the frequent errors of diagnosis made in relation to it.

In retroversion the uterus, as the name indicates, is turned completely *backwards, the os* uteri looking upwards and forwards, the fundus lying in *the hollow of the* sacrum, and sometimes almost on the perinæum.

s of importance that you should clearly understand the difference be-
retroversion and retroflexion of the uterus. In the former the whole
is, as I have explained, turned over ; in the latter it is flexed, or bent
oint usually corresponding to the os internum. These two very dis-
affections are frequently spoken of as identical, or at most as differing
n degree.

roversion, at all times a rare affection, is still more rarely met with un-
cted with pregnancy. It generally occurs about the end of the third
h of pregnancy, and the first symptom it gives rise to, almost invaria-
s retention of urine. You will be asked to see a woman in the third or
h month of pregnancy, who will tell you that she is unable to pass
; and on examination you will find the bladder to be distended with
. On emptying it, you will on a further examination find that a
lar body occupies the hollow of the sacrum and that the os uteri is
up beyond the pubes, possibly altogether beyond your reach; at the
time, a bimanual examination will prove the uterus to be absent from
rmal position. But possibly the patient may tell you, as in the case at
nt under our observation, that she is able to pass water, nay more,
t it is always coming." This is a statement which constantly misleads
perienced practitioners ; the dribbling of urine is under such circum-
es but the overflow of a too greatly distended bladder, and if you fail
cognise this, and promptly to empty the bladder, your patient's life
be endangered, possibly lost. She may die of peritonitis, or of uræmic
oning, or the mucous membrane of the bladder may become softened and
sequently gangrenous, and death ensue.

he causes producing retroversion of the uterus are various. Frequently
displacement appears to take place suddenly. A pregnant woman makes
ffort such as that requisite to lift a heavy weight, and immediately ex-
nces some pelvic distress. By-and-by she finds that micturition is im-
ible, and on examination retroversion is found to exist. The conclusion
at the displacement took place on the moment. I doubt if this expla-
on is ever perfectly correct. Most probably the uterus had been, ever
e, probably before the occurrence of pregnancy, lying in an abnormal
tion—namely, more or less across the pelvis, and that the sudden mus-
r effort, the bladder being at the time distended, merely completed the
lacement which had previously been in gradual progress. The subsequent
ntion of urine is the result of two causes—one, that the posterior wall of
bladder is drawn down by the uterus, to which it is attached: the other,
the neck of the uterus presses upon the urethra, and thus obstructs the
of urine. But in some cases the patient cannot assign any cause for the pro
tion of the distressing symptoms from which she suffers. There may have
n a gradually increasing difficulty in evacuating the contents of the bladder,
finally that cannot be effected at all, or at most, but partially, only a very
ll quantity of urine being voided at a time. What has occurred under such
umstances probably is this: the patient, previous to her becoming preg-
t, may have been the subject of retroflexion of the uterus; pregnancy occur-
g, the fundus of the uterus, as it enlarges, instead of rising, sinks gradu-
y lower, drawing down with it the posterior wall of the bladder, the
ion in time being thus converted into a version. This, however, is, I
eve, of very rare occurrence. I have, on the contrary, frequently known
ients, the subjects of retroflexion of the uterus, to become pregnant, and
ve observed that as utero-gestation advanced, the fundus gradually rose,
d finally assumed its normal shape and position. Dr. Barnes believes that
is effected by the gradual enlargement of the fundus upwards, there be-
g no obstacle to its growth in that direction, and that thus, in time, the
vic portion is partially "drawn out of its lodgment."

Cases of retroversion of the gravid uterus usually terminate in one of
ree ways :

1. The uterus may be raised above the promontory of the sacrum and
tero-gestation proceed normally ;

2. *Abortion may occur ; or,*

3. *Death may ensue.*

I shall here detail for you the particulars of the case of the patient at present in hospital, as she is likely to afford an example of the first and most favourable termination of this displacement, and it will also, I think, impress on you deeply, the importance of being able to recognise the affection, for this woman had been under treatment for some time before she came under my care, without the true nature of her case being suspected.

A. M., a married woman and the mother of five children, was admitted into hospital a fortnight ago, evidently suffering great pain. She stated she had a "tumour" in the abdomen, which had existed ten or twelve days, during the whole of which period she had been in constant pain. For some time previous to the formation of this "tumour" she had, she said, experienced a good deal of discomfort, or rather distress, which was greatly increased by a constant desire to pass water, her efforts to do so being but partially successful, only a very small quantity of urine being voided at a time. Latterly, however, her condition had undergone a great change: there was now incontinence of urine, or, to use her own words, "it was constantly coming from her;" nevertheless, her sufferings were, if possible, more intense than ever. On passing the hand over the abdomen, a well-defined tumour could be felt above the pubes, pressure on which caused great pain. A vaginal examination detected another tumour lying in the hollow of the sacrum, and almost resting on the perineum. The os uteri was absent from its normal situation, lay high up behind the pubes, and could not be reached without the greatest difficulty. On questioning her, she stated that, though a married woman, she did not think she was pregnant, but on being pressed on this point, admitted that she had not menstruated for at least ten or twelve weeks. On proceeding to pass a catheter, she objected, stating that this had been done the day before, and that she was told that there was no water in the bladder. However, being satisfied that this statement must be incorrect, I persisted, using for the purpose an ordinary No. 9 gum-elastic catheter, and drew off about two quarts of turbid, highly ammoniacal urine. The diagnosis was now clear and a careful examination verified my previous impression, that I had to deal with a case of complete retroversion of the gravid uterus.

The thorough emptying of the bladder was followed by much pain, and fearing that peritonitis might supervene, I desisted for a time, after one ineffectual attempt, from any further effort at replacing the uterus in its normal position, and with a view of allaying the pain which this woman suffered, administered half a grain of morphia, in the form of a suppository.

After the lapse of eight hours, I found her in a comparatively satisfactory condition. She had slept, and the pain had nearly altogether subsided. The bladder was now again emptied, and the patient being placed in the ordinary obstetric posture, on her left side, I proceeded to endeavour to raise the uterus. For this purpose I introduced two fingers of the right hand into the vagina, and made steady pressure on the fundus, directing it upwards and rather to one side. Such of you as were present will remember the stress I laid on the apparently trifling point of making the pressure laterally, instead of directly upwards: by so doing the promontory of the sacrum, which often opposes a serious obstacle to the ascent of the fundus, is avoided. In the present instance the effort I made, as described, was attended with complete success; the fundus yielding to the steady pressure, slipped above the brim, and remained there; the patient experienced great relief, and has since progressed favourably. The catheter was, however, used regularly night and morning for some days subsequently, for though the patient could pass water, she was unable to empty the bladder, and it was very desirable that no accumulation should be permitted to occur. This precaution —namely, that the catheter be passed twice a day, in all cases in which retention has continued for a considerable time, should never be omitted, otherwise the bladder may not recover its tone. The subsequent history of this patient presents no point of interest; pregnancy is proceeding normally, and there is no reason to suppose that she will not go to her full time.

This fortunate termination is not, however, to be frequently expected, in *the great majority of* cases in which retroversion of the gravid uterus takes

, abortion occurs either as a direct consequence of the accident or as a
of the treatment necessary to effect reposition; therefore, be always
il to give a guarded prognosis. Thus, not long since I was urgently
sted to visit a lady who, in the twelfth week of pregnancy, suddenly
vered that she was unable to pass water. I found her in great agony,
g for some hours endeavoured ineffectually to relieve herself. She
that she had always enjoyed the most perfect health; that on the
ng of the day on which I saw her she had been engaged superintend-
ome domestic arrangements, during the progress of which she had as-
l in raising a heavy box to a considerable height; that at the moment of
ng this effort she became conscious of "something giving way inside"
but, as at the time she did not experience any discomfort, she thought
ore about it, till after the lapse of some hours, being desirous to pass
r, she discovered that she was unable to do so. By-and-by her suffer-
from this cause became severe, and she sent for me. I at once recognis-
e nature of the case, emptied the bladder, and endeavoured to raise the
s, which I found to be retroverted, above the brim, but my efforts were
ctual. In this case I passed the catheter morning and evening, on
occasion of doing so, endeavouring by pressure on the fundus to re-
the uterus in its normal position, and on the sixth attempt, that is, at
nd of three days, succeeded in doing so. This patient seemed to go on
for a time, but after the lapse of ten days, a sharp dash of hemorrhage
rred, and she aborted. My belief is that in this case the force necessa-
exerted to replace the fundus, and not the accident itself, was the cause
e abortion.

t abortion is not the result most to be dreaded—death may possibly fol-
. One fatal case occurred in my own practice. This patient was further
nced in pregnancy than either of those just alluded to, before her suf-
gs induced her to seek relief. It was her first pregnancy, and she was
ble in any way to account for the displacement. The symptoms appear-
o have developed themselves very gradually, and the difficulty of mictu-
n to have been progressive, till finally it became impossible. As well
ould be ascertained, she was, when I saw her, in the sixteenth week of
gnancy: the whole of the abdomen was very tender to the touch, and
retroflected uterus nearly filled up the true pelvis; the greatest difficulty
experienced in raising the fundus. This was mainly due to the size of
uterus: but I am also of opinion that the uterus was bound down by
esions. Abortion occurred within twenty-four hours after the reposition
he fundus had been effected, and she died in a few days. I am of opin-
that this may have been a case of congenital retroflexion, which, under
influence of pregnancy, was, as previously explained, converted into one
retroversion. The adhesions were of recent origin; probably local suba-
e peritonitis existed previous to the raising of the fundus, and that this
sequently spread over the whole abdomen and proved rapidly fatal.

In the treatment of retroversion of the gravid uterus, two indications are
inly indicated, one being to keep the bladder empty, the other to restore
uterus to its normal position. The former should always be effected by
ans of a long gum-elastic catheter, for an ordinary silver female catheter
ll often in these cases fail to reach the bladder, so greatly is the urethra
ngated and displaced. The bladder being emptied, it is generally advisa-
e to attempt reposition at once, unless, as in the case first narrated, great
in is caused by doing so, under which circumstances it is wiser to allow
me hours first to elapse, care being taken to pass the catheter at short in-
rvals.

In the majority of cases, especially if pregnancy has not advanced beyond
e twelfth or thirteenth week, steady pressure, exerted by means of two fin-
rs introduced into the vagina, will be successful in raising the fundus,
re being taken to make the pressure rather to one side, so as to avoid the
promontory of the sacrum. Occasionally, however, you will fail to effect
position by this means. When this is so you will sometimes succeed by
troducing one of Dr. Barnes' india-rubber bags into the rectum, distending
with water, *while pressure is still* exerted by the fingers in the vagina. If

these efforts fail in raising the fundus above the brim, no resource remains but to bring on abortion. This under the circumstances is best effected by introducing a catheter or sound into the uterus, and if possible rupturing the membranes, but sometimes, in consequence of the os uteri having been forced up behind the pubes, the introduction of a catheter or sound is impossible, and then, as a last resource, an effort should be made to lessen the size of the uterus by tapping it through the rectum by means of a fine trocar or aspirator. This has been done several times successfully; the liquor amnii having been evacuated through the trocar, abortion followed, the patient subsequently recovering; but in all cases of retroversion the tendency to abortion is great, and occasionally peritonitis supervenes. Bear in mind that, in addition to abortion, the possible occurrence of peritonitis is to be dreaded, and death may ensue from this cause. Retroversion, therefore, of the gravid uterus is always to be looked on as an accident of a very serious nature.

But supposing you have succeeded in raising the fundus, the patient will still, under the most favourable circumstances, need care for a considerable time. It is essential to attend to the state of the bladder, and to pass the catheter at stated intervals till satisfied that the organ has regained its tone, and you must watch lest the fundus of the uterus fall down again into the pelvis. To lessen the risk of this occurring, and also with a view of counteracting the tendency to abortion, you should for some time confine the patient strictly to the recumbent posture. As the uterus enlarges, the risk of a relapse lessens, and after a time becomes impossible, but the tendency to abortion for a long time continues, and in a comparatively small percentage of cases does the patient reach the full time of pregnancy.

Before concluding my remarks on this subject, I must say a few words on the question of diagnosis. In all the cases which have come under my observation in which an error in diagnosis had been made, no sufficient examination appeared to have been instituted; thus, with respect to the patient whose case I am specially alluding to, the act that she was suffering from retention of urine was not recognised, although the enormously distended bladder could be easily felt above the pubes. This negligence is quite inexcusable. But it is just possible that an ovarian or other tumour occupying Douglas' space might be mistaken for a retroverted uterus, even though an examination had been instituted, especially if it were large enough to press against the urethra and thus obstruct the flow of urine; but in such a case the symptoms of pregnancy will probably be wanting, and, moreover, a careful examination will detect the uterus, which, under such circumstances, would probably have been forced up above the pubes, lying anterior to the tumour. Any other tumour, such as that caused by the sudden escape of blood into the recto-vaginal *cul-de-sac*, may, in like manner, cause some perplexity. All doubts, however, will be dispelled if, on emptying the bladder, the uterus is found lying anterior to the tumour. Excusable errors in diagnosis, then, in cases of retroversion of the gravid uterus, are possible, but with ordinary care such should rarely, if ever, occur.—*Medical Press and Circular, April* 14, 1875, *p.* 316.

83.—THE DIAGNOSIS AND TREATMENT OF PLACENTA PRÆVIA.

By Dr. Charpentier.

Dr. Charpentier, in the Archives de Tocologie, gives some practical directions on this subject:—

If attention be paid to the following points, the diagnosis can be made without much difficulty. First, the time at which the hemorrhage first makes its appearance, viz., from the seventh to the eighth month, in some rare cases as early as the sixth month; the fact that it comes on suddenly, without any known cause, and stops as suddenly; and that it reappears at *uncertain intervals*, but in increasing quantities, up to the time of labour.

Second, the absence of ballottement, the thick mass of the placenta being interposed between the finger and the fœtal presentation.

The hemorrhage, in cases of placenta prævia, is always external; it takes place during the uterine diastole, but is expelled during the systole, and if the latter were continuous it could hardly take place at all.

Artificial delivery is a most dangerous method, only suited to most urgent cases. The rupture of the membranes is very good treatment, provided the os is partially dilated. It is hard to do when the presentation is complete. The use of ergot is a powerful auxiliary, but it increases greatly the danger to the child, and is contra-indicated in contraction of the pelvis, organic disease of the uterus, and mal-presentation.

The author looks upon the plug as the treatment *par excellence*. It requires to be applied skilfully to be of any great use. Charpie or tow are the best materials with which to plug, and if properly applied, the author considers such a plug superior to any description of india-rubber bag which can be introduced into the uterus and inflated. The great point to attend to when plugging is to introduce enough of the charpie or tow, as much as a pound and a half of the former material being sometimes necessary. The bladder and rectum should both be emptied before we proceed to plug. Some practitioners dip the first pledget in a solution of perchloride of iron. This is not necessary.

The charpie should be rolled into small balls, the first twenty or thirty of which should have a piece of thread attached. Before being introduced they should be well covered with cerate. This renders a speculum unnecessary.

The author lays great stress on packing tightly the anterior and posterior *cul-de-sac*, but especially the latter. The success of the operation depends to a great extent on this being well done. The vagina itself should be filled with the small pledgets, until they appear externally. Then you apply a handful or more of dry charpie, and over that three or four compresses, the whole being fixed by a T bandage. If this plug be well applied there can be no hemorrhage. If the charpie at the vulva become moist it is a proof that the plug is bady applied, and it should be removed at once and re-applied. To be of much service the plug should be left in from twelve to twenty-four hours.—*Medical Press and Circular, April* 18, 1875, *p.* 373.

84.—ON ADHESION OF THE PLACENTA.

By Dr. J. G. Swayne, Consulting Physician-Accoucheur to the Bristol General Hospital.

The *diagnosis* of placental adhesion is a matter of considerable uncertainty, unless the hand be introduced into the uterus, so as actually to ascertain by the touch the nature and extent of the adhesion. Before this is done, we can only form probable conjectures. We may suppose that there is morbid adhesion, if, after the child is born, on placing the hand over the fundus uteri, the uterus can be felt contracting repeatedly and even energetically without any apparent result; and this presumption is strengthened if the cord, on gently pulling it and then letting it go, be observed to spring back as if the placenta were tightly held by the uterus, especially if we can feel that there is no constriction of the circular fibres of the uterus to account for this. It should be borne in mind, however, that the presence of irregular contraction of the uterus is no proof of the non-existence of placental adhesion; for in some of the worst cases these conditions coexist. The introduction of the hand is equally necessary in either case, and soon removes all doubt as to the cause of retention. The existence of hemorrhage proves nothing, as this may accompany retention of the placenta from any cause.

The *treatment* of adherent placenta should be prompt, because this complication is generally accompanied with hemorrhage, which may speedily become dangerous. It is never safe to leave such cases long to the unaided powers of nature, *or to rely on* ergot, styptics, or any kind of drug. The

hand of the accoucheur supplies the only safe and effectual remedy. To employ this remedy properly, some coolness and dexterity and a considerable amount of patience are required. The hand has sometimes to be kept in the uterus for half an hour or more before the operation can be completed. In the ordinary obstetric position, the woman lying on her left side, the left hand will be found to be much the most convenient for this purpose; but, to perform the operation properly, both hands should be used. The right hand applied externally over the fundus uteri steadies the uterus, and gives important help to the other hand during these manipulations. If, in addition to placental adhesion, there should be an hour-glass contraction of the uterus, the case is rendered more tedious and difficult; for the circular constriction has first to be overcome before the hand can be passed far enough to separate the adhesions. In such a case, the vagina will probably be found to be loose and capacious, and perhaps filled with clots; whilst the upper portion of it is occupied by a firm fleshy mass, into which the cord is apparently inserted. On making a careful examination, however, by passing up the fingers of the left hand along the cord, which should serve as a guide, this mass is found to be the uterus, tightly contracted around the retained placenta; the circular fibres of the os uteri internum surrounding the cord very closely. This is precisely the condition of things which leads to those horrible blunders which are sometimes committed by ignorant and incompetent practitioners. A practitioner of this sort, for instance, having waited a reasonable time after the birth of child for the expulsion of the placenta, and finding that this does not take place, and that, moreover, there is some hemorrhage, endeavours to remove the after-birth by tugging at the cord. The only result of this proceeding is, that the cord breaks short off, and the hemorrhage is increased. By the breaking of the cord, he loses his guide; and, becoming still more flurried from observing the fresh hemorrhage, he passes up his hand, and feels nothing but the uterus tightly contracted around the placenta. Mistaking this for the latter, he gets his fingers into the hollow of the sacrum behind it, with the object of scooping out the after-birth, which he supposes to be (what the old nurses call) "grown to the side." At last, by means of his nails, he succeeds in separating the posterior wall of the vagina from its attachment to the uterus, and gets his hand into the pouch of Douglas, and of course, in the peritoneal cavity. Still unaware of his mistake, he grasps the fundus uteri from behind; and, thus obtaining a good purchase, he tears away the entire organ; and then at last, with the appearance of the intestines, the horrible conviction of his blunder dawns upon him.

Such is the manner in which we may reasonably suppose that many of these awful cases of malapraxis take place. I need scarcely remark that such accidents ought to be impossible to any one possessed of the smallest amount of skill and anatomical knowledge.

To pass on, however, to the manipulation necessary in these cases: if the cord be tightly encircled by the os uteri, the constriction should be overcome by insinuating the tips of the fingers into the os in a conical form; whilst the right hand all this time is making counter-pressure upon the fundus uteri, so as to steady that organ. Should these precautions be neglected, the connections between the vagina and the uterus may be put very injuriously on the stretch, especially if the circular fibres of the os oppose much resistance to the introduction of the hand. As the tips of the fingers pass through the os, they should be gradually expanded and separated from one another, until, by sheer fatigue, they overcome the contraction of the uterine fibres, so as to allow the passage of the entire hand into the uterus. When this is accomplished, the next step is to pass up the hand sufficiently high to reach the placenta. The distance which it has to pass before this can be felt will depend very much upon the position of the placenta and the degree of contraction of the uterus. If the placenta be attached, as it usually is, to the fundus uteri, or if the uterus be in a flaccid condition, it will be necessary to pass the hand much further than when the placenta is attached lower down, or when the uterus is well contracted. I have sometimes had to pass *the hand* quite into the epigastric region in search of a retained placenta. *As soon as the placenta* is arrived at, the fingers should be spread out, taking

care not to entangle them in the membranes, until the circumference of the placenta can be felt. If any portion of the circumference be already detached, the tips of the fingers should be cautiously inserted between this portion and the inner surface of the uterus, and the placenta gradually peeled off. All this time, the right hand, externally applied, steadies the portion of the uterus from which the left hand is detaching the placenta, and enables the accoucheur to estimate the exact thickness of the uterine walls included between the hands, so that he can avoid digging his nails into the substance of the uterus. There is sometimes considerable danger of such an accident when the adhesions are very firm and close. There is also considerable danger of leaving portions of placenta behind: a risk that one can readily comprehend in such cases as those described by Dr. Ramsbotham, who states: "I have opened more than one body where a part was left adherent to the uterus, and where, on making a longitudinal section of the organs, and examining the cut edges, I could not determine the boundary line between the uterus and the placenta, so intimate a union had taken place between them." In all such difficult cases, it will be necessary to sever the adhesions by using the finger-nails with a kind of sawing motion from side to side. The tips of the fingers are placed in a line like the edge of a saw, keeping the palm towards the placenta and the knuckles towards the uterus, and the sawing motion is continued very slowly and gradually, until the entire placenta is separated and falls into the hollow of the hand. This proceeding sometimes requires a great deal of patience, and is exceedingly tiring; but the accoucheur should take his time about it, working with both hands, and making his ground sure as he goes on, and not withdrawing his hand with the placenta until he is certain that he has brought away every part of it that can be safely separated. It is very seldom, comparatively, that the adhesions are so firm that this cannot be done. Should this, however, be the case, we have a choice of evils: either to run the risk of causing secondary hemorrhage and septicæmia by leaving portions behind, or of causing metritis from injury to the uterus in bringing them away. For my own part, I think that the last of these two courses is the least dangerous, except in very unusual cases. I have notes of only two instances in which it was necessary to leave any portion of consequence behind. Fortunately, in both, the pieces were expelled on the third day, without having caused any untoward symptoms, although in one the piece expelled was as large as a hen's egg. Of course, in all such instances, the dangers of septicæmia should be guarded against as much as possible by the frequent use of vaginal injections containing Condy's or other disinfectant fluids.—*British Medical Journal, June* 19, 1875, *p.* 802.

85.—ON AUTOGENETIC CASES OF PUERPERAL FEVER.

By Dr. Robert Barnes, London.

[The following remarks were made by Dr. Barnes during a discussion at the Obstetrical Society of London, on the subject of puerperal fever.]

These cases are as distinct in their origin as many cases of infection. For example, you see a woman in the country away from all sources of infection; a little bit of the placenta is retained, a clot of blood is there, or some change takes place in the uterus, and there is an element of infection; it runs along the veins or the lymphatics, is absorbed by the mucous membrane; then you get the blood tainted, and the slightest matter will set it going; the whole system is in a ferment, just as it was from the poison of scarlet fever or typhoid; you may call it pyæmia or scepticæmia, the result is about the same. These cases come on a little later than those which have a zymotic origin, and they can often be arrested by washing out the uterus, and bringing away any superfluous matter there. Many women will succumb at once or rapidly to a single dose, no matter how small it may be, but

others can resist to a certain extent; their excretory organs may be *in* good working order, and they may throw off a moderate dose or two moderate doses; but they cannot survive repeated doses. If you can wash out the uterus, you may prevent the renewal of the poison, and stop the disease. That principle has recently come into vogue again. It was practised and taught with success by Harvey, who, if he had not been the greatest of physiologists, would have been perhaps recognised as the foremost obstetrician in the world. This mode of infection is one of very great importance for us to consider. There was a case referred to by Dr. Huntley, who believed that infection was taken into the medical attendant's system, and might be given off by the skin. I believe it may be propagated by the breath of a medical attendant or a nurse. We must all be conscious sometimes of taking in poisons by coming into contact with poisonous patients. I have gone away from a craniotomy case, where the brain was foul, stinking of it, my breath smelling for a day or two. So with other diseases. So with dysentery, I had shivering, diarrhœa, and foul breath, from the odour of dysenteric stools, for two or three days after being in contact with a patient of that kind. A man may walk about charged with infectious disease, and those who are susceptible with whom he comes in contact may catch it; those who are not may perhaps have a little dose, which they can throw off, the system being in good working order, and there is an end of it. But a lying-in woman, with the blood ready to ferment, would be readily attacked. There is the secret of the difference. A medical man who has seen a case of scarlet fever comes in contact in the course of the day with twenty or thirty patients, and it is perhaps only the lying-in woman who takes the disease; not that he is necessarily longer with her, but there is a greater liability on her part. I had a letter this morning from the son of an old member of this society—a former vice-president,—who calls my attention to a work by his late father, Dr. Uvedale West. He gives one example which is instructive, and I thought you would like to hear it. He had an outbreak of puerperal fever in his practice; he had to deliver a woman to whom he went straight from a case of erysipelas, and this woman had erysipelas the next day; he went afterwards to another patient, whom he did not examine, and that woman escaped; the next day he went to another case, and the woman died. That is the history of a great many of the epidemics in the German lying-in hospitals, where they have the faculty, as it seems to me, of manufacturing puerperal fever on a large scale. Those women who are lucky enough (we should consider them unfortunate) to be confined in the streets, on their way to the hospital, escape puerperal fever; it is only those who are examined repeatedly that catch it. That has been observed over and over again. If I might be permitted a moment or two longer, I could give you the history of a series of cases occurring in the practice of one midwife in a short time, while all the surrounding neighbourhood was at the time pretty free. I will now sum up my conclusions in reference to the questions submitted by Mr. Spencer Wells. "Did you ever see a case of puerperal fever which is not really a case of scarlatina or rubeola, or erysipelas or traumatic fever caused by the bruising or tearing of parts?" I do not think there is any fever caused simply by bruising the parts. If there is a little scratch, no matter how small, and the poison is conveyed to it, that is a different case. It is not necessary to suppose that there is a puerperal fever which runs a definite course like scarlet fever. We get a fever which is fatal, and that is serious enough to be considered as a case of puerperal fever. As to the question whether there is a real form of puerperal fever which is not scarlatina or any of the conditions specified, I will say that there is, and I have called it excretory puerperal fever. We have albuminuria at the end of pregnancy, and those cases are extremely apt to go into puerperal fever. The blood is peculiarly overcharged, the liver and kidneys cannot act, excretion is at an end, and then the poison runs riot without any ingestion of poisonous matter from without. That is pure puerperal fever which the patient herself can generate. Then, as to how the spread of the disease can be prevented. I can only say by *careful* isolation of the patient. The conditions of practice are sometimes

patible with that. There was a case mentioned by Dr. Uvedale West. is on the point of going away, and there was no one to take his place. patient sent for him, would have him, and she fell a victim. That appen to any one in the country. He cannot get away when he likes. regard to the question of bacteria, as I know nothing about it, I had say nothing; but I may reserve my doubt with Dr. Richardson, and ll the bacteria doctrine is proved by those who understand it. With l to the value of antiseptics in order to keep hospitals free, I think that p hospitals free from puerperal fever is an extremely difficult matter— difficult than it is in a surgical hospital to keep it free from pyæmia. annot keep a series of patients in a hospital isolated, in the proper of the word. You have the same nurses going to them; you have a y of influences acting upon one or two patients, and the consequences e radiated to others. There is only one secret for safety, and that have the woman confined at her own house, where she can have her urse, who has not been in the way of infection, and her own medical dant. Then the chances are that she will go on favourably and hap- Without that there is no security. A lying-in hospital is not now by eans so serious a danger as it used to be; still it is always like a vol- which may explode at any moment.—*Lancet, May* 15, 1875, *p.* 687.

86.—ON THE INFECTION OF PUERPERAL FEVER.

By Dr. SWAYNE, of Clifton.

to the mode in which the infection of puerperal fever is conveyed, I k it is generally conveyed by the person of the accoucheur more than by clothes or any other way. Some men are peculiarly unfortunate in this ect. It is often observed that all the puerperal cases in a district are led to a few practitioners. It is not only that they have the run of them particular time, but even after a long interval it is the same men who them. Some men, I believe, have the power of absorbing and exhaling e poisons to a much greater extent than others; and from remarks I have e in my own experience, I am inclined to think that the poison is much e likely to be given off by the skin than by the breath of the practitioner. ve come to the conclusion that men who have very moist, perspirable , especially moist hands, are much more likely to exhale it than those e hands are generally dry and cool, especially if they have to make fre- nt examinations during labour. With regard to the precautions to be taken revent the spread of puerperal fever, I cannot think that it is necessary for edical man to exclude himself for more than a week at the outside from wifery practice. If he is unfortunate enough to have a bad case, probably hat time the poison will have passed out of the system. He should also e the precaution of not wearing the same clothes. I am not aware of hav- conveyed anything of a puerperal kind to a patient except once. That in a case of scarlet fever. As a general rule I now refuse to go to a case scarlet fever, unless of course it should occur to a lying-in-woman. I re- e to see children with scarlet fever on account of the danger of conveying Some years ago I did not do so. I was attending a child with scarlet er, and I attended a lady at the same time. About a week afterwards the h came out, with sore-throat; she did perfectly well, and did not show f symptoms of puerperal fever. But the worst case of scarlet fever I ever was in a lady who, about a week before her confinement, called at a se where the fever was; the children were ill, and she was afraid to go ; but most imprudently the mother came out directly from the sick room report how they were going on, and she put her head into the carriage to k to this lady. In that case the scarlet fever came on *pari passu* with the our. I attended *her about 10 o'clock at night. I observed that her face* ame *red, and at the latter part of* the labour the speech was rather muffled.

The redness of the face did not excite particular attention, as it generally comes on at the second stage of labour. On the next day I found she had been delirious; she was covered with a thick rash, had a sore throat, and died in two days. Immediately after seeing a case of puerperal fever I go home, and before going to bed take a warm bath and wash myself with carbolic soap; and on the next day I take a Turkish bath, which I think is an excellent way of eliminating the poison and cleansing the skin. I need hardly say that, with every accoucheur personal cleanliness is of the greatest possible importance. We know that cleanliness is next to godliness. We cannot be too particular about it, especially after seeing cases of this kind; and we should be very careful not to wear the same clothes. With these precautions in a very few days there will be little or no danger of conveying the poison from one patient to another.—*Lancet*, *May* 15, 1875, *p.* 690.

87.—ON THE INFECTION OF PUERPERAL FEVER, OR PUERPERAL PYÆMIA.

By Dr. Graily Hewitt.

The opinion which I have formed with respect to puerperal fever is that it is essentially a form of blood-poison. Some seven or eight years ago I read a paper before this Society in which I detailed the experience which had occurred to me in the British Lying-in Hospital with which I had been connected for some time. I brought forward a considerable number of cases, and in giving my conclusion in reference to the nature of the malady, I expressed myself in these words:—"It is impossible to escape the conclusion that puerperal fever consists in nothing more nor less than an injection into the general circulating fluid of a poisonous material of animal origin; that it is a form of pyæmia for the production of which the minutest portion of the morbific agent may prove sufficient." I was very early impressed with a lecture published by the late lamented Sir James Simpson, of Edinburgh, I think about 1859, in which he strongly advocated the doctrine that puerperal fever is a form of pyæmia; and what I had seen at that time, and what I have seen since, has certainly led me to endorse that view of the matter in the strongest manner possible. I may say that I entirely disbelieve in the existence of a form of fever which is sufficiently definite and precise to receive a distinctive name, in the same sense that we speak of typhus fever, or typhoid fever, or measles, or scarlet fever, or small-pox, each of which has a definite and well-determined course. I can see nothing in puerperal fever which at all resembles this. I think all the clinical evidence producible on the subject is entirely opposed to that view, and therefore I have no hesitation in answering that part of the question put by Mr. Spencer Wells in the way I have done. I think it would be profitable to divide the cases of puerperal fever, or puerperal pyæmia, into two classes. There are the cases in which there is very distinct evidence of the introduction into the system from without of a morbid animal poison; there are, in the second place, cases which do not resemble these, in which the evidence is wanting of the introduction from without of such a morbific poison; and I will endeavour to make my remarks under those two heads. In the first place, in reference to the cases that occur from the introduction of poison from without, after what has been said on this occasion and on former occasions, there can be no question that it has over and over again happened that the disease called puerperal fever has been produced by inoculation (the word seems to me to be suitable) in those unfortunate cases where the medical man himself conveys the disease, and in those cases where the midwives are equally efficacious in communicating it. It is to that class of cases that I would first call *attention. It is* my impression, from all that I have seen, that the manner in *which this* communication takes place is, in a large proportion of cases, by

of the hand, and I believe that the spaces beneath the nails, and un- skin which cover the nails, are exceedingly liable to harbour these destructive products; I do not say that they are limited to those the skin of the fingers may also be their habitat. We know what some- akes place after a post-mortem examination, when it is exceedingly t to get rid of the smell of the corpse from the hands, cleanse them in er way you will. I am speaking now more particularly of what hap- some years ago, before carbolic acid and other disinfectants were much or used. It is not so difficult now as it was. At all events, I believe e nails and the neighbourhood of the nails are the parts more particu- able to harbour these infecting materials. It seems to me rather unlikely e clothes carry infection so readily. Of course, where a person allows fs of his coat to be dipped in putrescent material, and then makes an ation of a patient in childbirth, something may happen after that. whole, I think the hand is particularly efficacious in this matter. I the opinion that some previous speakers have expressed, that very ttention should be bestowed on cleansing the hands in all cases where e to be used in midwifery practice. A good deal has been said of late n reference to the armamentaria that medical men should be provided nd I think a useful addition would be a pot of carbolic ointment and a ush. In the next place I would remark that it has seemed to me that imal poison introduced from without may produce what we term puer- yæmia, the same as may be produced by a student who is handling l wounds in the hospital and attending midwifery cases. I have in- of this in the case of a medical practitioner going from one puer- ase to another. I see no difference in the attack produced in these fferent ways: there is nothing whatever different in regard to the l features of them. Another mode in which the poison is introduced ithout is due to carelessness in washing the patient or an improper l of washing. I think water ought never to be used for cleansing the m in the case of a recently delivered woman; I think it is far prefer- use a dry clean rag or dry cotton-wool. This plan secures greater ity from the passage of the débris from without. Then there is an- ethod by which poison may be introduced from without—that is, in se of laceration of the perineum; I think this mode of introduction is y uncommon. I recollect being called into consultation to see a lady as suffering from puerperal pyæmia. Very great care had been taken er to keep her exceedingly quiet, and she had not been allowed to be from her position (lying on the back) for some days after labour. The m had been slightly torn. Now in this case the discharges were pu- t. It seems hardly possible to escape the conclusion that in such s this there is a pool of putrescent material in the vagina constantly act with the abraded perineal surfaces. Is it to be wondered at if f this is absorbed? I think it is bad practice in all cases to maintain ient too persistently in this position on the back. I think there is an age in turning her from side to side occasionally, in order to allow of ape of putrescent débris from the vagina. Not that it will produce a in all cases, but if there is a laceration of the perineum it is more to do so. So far for the cases which come under the first category. ow proceed to discuss those which are more difficult to define and larise—those on which the affection does not apparently depend upon g introduced from without. This class corresponds to the cases de- ted by Dr. Barnes "autogenetic." In the first place I would remark is exceedingly easy to produce pyæmia in the non-puerperal woman dling the uterus in a certain way. I have seen acute pyæmia produced action of a sponge tent at the os uteri, left in too long, and pro- violent inflammatory symptoms, and death in a few days. It is well that this event may happen; the uterus is so constructed that it is ingly easy for pyæmia to occur in it and in its tissues: the walls are very the vessels are very large, they communicate very freely (I am now g of the uterus in the non-puerperal state), and a slight wound may moment *set up pyæmia*. I have always been unable to see any precise

difference between an attack of pyæmia in a puerperal state and non-puerperal state; the symptoms are precisely identical, they only differ in degree. I do not wish to give my remarks the semblance of a lecture, but I thought it might be interesting to bring a specimen (which I have done) representing the healthy uterus immediately after delivery, in order to show the condition of the organ at that moment. I have also brought with me a plate by a celebrated embryologist, exhibiting the condition of the uterus after delivery. Doubtless a great many teachers of midwifery are familiar with it. It will serve as a peg on which to hang the remarks to which I shall call your attention in the next place. In the uterus after delivery we have an organ precisely analogous to a sponge; it has large interstices, large spaces freely communicating, and, moreover, these spaces open into the uterus through the vessels which have communicated with the placenta, and these openings are filled up by certain clots. The natural event after labour of course is that the uterus becomes contracted, and a progressive diminution occurs in its size. This is the safeguard, and this is the important vital phenomenon which belongs to the after-period of childbirth. Now it is my belief and conviction from all I have seen, that if we wish to obtain a clue to the manner in which puerperal pyæmia is produced, we must regard this process very attentively, and notice particularly the deviations from the normal physiological process which are so liable to occur. It is some years now since my attention was first directed to the fact, but it is a fact which I have been able to confirm by repeated observation since, and which I deem to be of the greatest importance in reference to this matter—that concurrently with the commencement of the attack of puerperal pyæmia the uterus is found to be enlarged; in other words, in a state in which its involution is absolutely retarded. I have never seen a case of puerperal pyæmia in which this condition of the uterus was absent, and absent at the very commencement of the malady. It seems to me, if this is a fact, that it is an exceedingly important element in the explanation of cases of puerperal pyæmia, of whatever kind they may be. It has seemed to me, in endeavouring to carry out explanations of these cases, that the thing which fails is the contraction of the uterus. That is where the breakdown originally occurs. The woman has a large bleeding, for instance, at the time of childbirth. The want of contraction in the uterus acts in precisely the same way as if all the locks of a house were taken off, and ingress allowed to any burglar who wished to enter the premises. This is precisely what happens, in fact, after a labour; the contractile power of the uterus fails to a certain extent, the expulsion of the débris ceases, and there occurs a suction action in the uterus by which the débris are taken up into the circulation. I explain those cases in which the scarlet fever poisons and other fever poisons apparently produce disease in this way: they destroy the vitality of the patient to a certain extent, they take away the safeguard, they abolish the contraction of the uterus, and they produce a paralysis of the uterus for the time being, and having once produced this paralysis the rest of the explanation is sufficiently simple. The pyæmic process immediately passes into the uterine sinuses, and it is a question whether the patient will survive, or whether the injuries in this manner will end in speedy death.—*Lancet*, *May* 15, 1875, *p.* 690.

88.—TWO CASES OF INOCULATION WITH THE SEPTIC LOCHIA OF PUERPERAL WOMEN.

By Dr. William Stewart, Barnsley.

The elucidation of the nature of the poison and the etiology of puerperal septicæmia, is of such vital importance, and, at the present time, occupies such a prominent place in the mind of the profession, that I feel no apology is required from me for bringing under the notice of the profession the two *following cases.*

Case 1.—Miss G., aged 52, a delicate woman, frequently suffering from hepatic derangement, and the subject of an obscure internal abdominal tumour, said to have followed an injury from a railway accident, called me to see her on Sunday, October 8th, 1871. I found her suffering from most excruciating pain in the right forefinger. The pain was so agonising that I was led to inquire whether she had not scratched or injured it in any manner, when she informed me she had very slightly scratched that finger and the one next to it a few days previously. Upon remarking further that I was afraid she had received some poisonous matter into the scratch, she then remembered having given an injection to a lying-in woman on the evening of the 6th (about thirty-six hours before my visit), whose nurse was very inexperienced, and had neglected to change the patient for several days after delivery. I was informed by the medical gentleman in attendance upon the confinement, that his patient had peritonitis at the time. My patient had wrapped a piece of adhesive plaster round the middle finger, which was therefore quite unaffected, but unfortunately had left the scratch on the forefinger totally unprotected. Here, then, was the clue to the case, decomposing lochial discharge applied to the recent scratch. This case ran a most acute and rapid course. Thirty-six hours after the application of the septic matter, I saw the patient. The finger was then hard and indurated, but not much swollen. The back of the hand was very red and much enlarged. The inflamed lymphatics in red streaks could be seen passing up the forearm; and in twelve hours more, in spite of all measures adopted to arrest the advancing disease, the finger had mortified. The next day, her relatives being very anxious, I met in consultation two neighbouring medical gentlemen, who agreed with me as to the cause of her symptoms; but the gangrene continuing to spread soon involved the other fingers, hand and wrist, and was followed by a fatal termination on the 10th, being ninety hours from the application of the poison, and about forty-eight hours from the time when I first saw the case. Throughout the short course of her illness, the general symptoms were those of high fever, persistent vomiting, and, towards the close, delirium.

Case 2.—The poison in this case was introduced from a puerperal patient in my own practice. Mrs. L., a primipara, was delivered by Dr. Heath, my assistant, on October 24th, 1874. Three days afterwards, symptoms of acute peritonitis set in, preceded by decomposition of the lochia and accompanied by profuse diarrhœa, and other symptoms of blood-poisoning. Injections of Condy's fluid into the uterus and vagina were used to disinfect the discharge. These were administered by Mrs. M. (her mother), who, on November 5th, two days before her daughter's death, had inflicted a slight wound with a table-knife over the first joint of her left thumb. The wound being slight, she did not consider it necessary to mention it, or to apply any dressing to the part, but continued to administer the injections without any protection to the thumb. On the 7th, I found her suffering from most violent pain in the thumb, which was swollen and indurated; the wound was gaping and sloughy in appearance, the back of the hand red, shining, and erysipelatous. A free incision on the thumb above the wound, followed in a few days by another on the back of the hand, gave exit to a large quantity of pus, and relieved to a certain extent the severity of the symptoms; but the purulent affection seemed to travel along the cellular tissue of the forearm, which in turn had to be relieved by incision. The lymphatics were inflamed as high as the elbow, where there was a patch of erysipelas. This case terminated favourably in six weeks, leaving only the first joint of the thumb stiff.

These cases appear to me to be specially instructive; first, because of the danger to which attendants are exposed when it becomes necessary to give vaginal injections to puerperal patients. And I think it becomes the duty of the medical attendant to warn the nurses to take precautions not to allow the discharge to come into contact with any recent wound or abrasion of skin. Secondly, they are exceedingly interesting from their tendency to throw light upon the nature and production of puerperal septicæmia, as they show that the application of *decomposing* lochia alone to a recent scratch or wound *has been sufficient of itself* to produce gangrene of the part and death

of the patient in the one case, and a very severe attack of phlegmonous erysipelas in the other, although no puerperal condition existed in either of the inoculated subjects. I think we may, therefore, draw the conclusion, that the passage of decomposing lochia over any abraded surface in the vaginal passage is sufficient to produce puerperal septicæmia without the importation of any other specific poison. In this manner, we may account for the disease attacking much more frequently primiparous cases, as the vagina and perinæum are much more likely to be slightly lacerated in those than in multiparæ. If it were possible to apply as effectually the antiseptic treatment to these cases as it is carried out by Professor Lister in surgical cases, I have little doubt that as good results would be obtained. Obstetricians too frequently begin to lock the door when the horse is stolen; we wait until there is evidence of decomposition having already taken place in the lochia before steps are taken to prevent or counteract the danger. Cannot some antiseptic means be devised to be used from the time of delivery? I should be inclined to think that folds of antiseptic gauze, instead of the ordinary napkin, and an antiseptic lotion for detergent purposes, would be of very great service, and might prove quite sufficient to prevent the setting in of putrefactive change in the discharge.—*British Medical Journal, April* 17, 1875, *p.* 503.

89.—ON PUERPERAL PYÆMIA.

By Dr. J. Thorburn, Lecturer on Obstetrics and Gynæcology, Owens College School of Medicine; Obstetric Physician, Manchester Royal Infirmary.

[Dr. Thorburn states that the following are the principles which he has taught, believed, and acted upon.]

1. The puerperal woman is placed much in the same position as one who has undergone a serious surgical operation involving raw absorbing surfaces, together with, not unfrequently, a sudden depression of the vital powers.

2. In virtue of this, she is specially liable to the attacks of infectious disease, and, when attacked, to sink rapidly under their influence.

3. She is also most liable to every form of pyæmia and septicæmia.

4. When attacked by these latter, she is subject, in many instances, to a group of fatal symptoms, which has, for convenience' sake, been termed puerperal fever.

5. This fatal group of symptoms, however induced, has a remarkable tendency to be conveyed to other parturient women in an almost identical form.

6. The mere theoretical question as to what we should call this group of symptoms has no bearing on the practical question. What must be done to prevent its propagation to other parturient women?

7. It is, therefore, the duty of every practitioner to avoid, as far as possible, any communication of the effluvia, secretions, or emanations of fever, erysipelas, pyæmia, unhealthy sores, or the like, to his obstetric patients.

8. This implies that he shall use all the precautions which modern science or his own knowledge recommends, such as the use of antiseptics, change of clothing, selection of time for visiting, and the like; but cannot possibly imply, in the present state of society, that no general practitioner shall, with proper care, visit simultaneously any cases of infectious disease and cases of confinement.

9. One of the most important precautions, however, is to abandon for a time the practice of midwifery whenever the practitioner is compelled (using Dr. Duncan's own word) to nurse a case of scarlatina, &c. By nursing, I mean to very frequently visit, stay with, or handle as a nurse does: the only means of saving many cases of fever.

10. When a group of symptoms, probably due to septicæmia or approximating to that popularly termed puerperal fever, has occurred to a practitioner, he should redouble the usual precautions; and, if he meet shortly

with a second case in his own practice, he is morally bound—I suspect legally also—to abstain from midwifery practice for some weeks. If Dr. Duncan could by statistics, of which he is so great a master, and which seem invariably to obey his command, determine the exact time of necessary quarantine, he would confer the greatest possible obligation, in more senses than one, upon the medical profession.

11. A professed obstetrician should not indulge in *post mortem* examinations, or other probable sources of septicæmia.

12. Midwives who, like Mrs. Marsden, nurse their patients from the commencement of labour till convalescence; who administer all enemata and vaginal injections, and who perform all ablutions, are not justified, after they have lost three nearly successive cases, in trying whether a fourth will die, after they have been warned by more than one medical practitioner of the danger incurred.

These principles of action, roughly sketched, I have ever taught in this school of medicine.—*British Medical Journal, June* 12, 1875, *p.* 793.

90.—ON PUERPERAL FEVER.

By Dr. Henry Savage, Consulting Physician to the Samaritan Free Hospital.

The lymphatics have been shown by Leopold to be very numerous in the mucous membrane of the uterus. The surface is highly absorbent, and the small vessels of the uterus are invaginated in these lymphatics. It is a very curious arrangement shown in Leopold's book. I fancy I have seen them. I do not say anything as to the microscope, since I find a power of fifty talked of, whereas I found a power of twelve difficult to manage. It seems to me then that, as a matter of demonstration, we have brought it down to this—that we have seen the septic matter, we have touched it and smelt it; have mentioned experiments in regard to the composition of it; and we now can have no difficulty in believing that some septic stuff will accumulate in the interior of the uterus, and get into the circulation, as it did in the case of the peritoneum. Now we come to the difficulty about the fingers, because I said that if I attended a woman in her confinement with my fingers in that state, I had no doubt she would have septicæmia, and I really have no doubt of it. You remember that we had some painful statements from a gentleman in the country who seemed to have had his fingers in that condition, and who lost case after case, and was obliged to give up his practice. I know it is difficult for most of us to comprehend how it is that the mere approximation of a finger should set agoing this curious septic thing. Now every old woman will tell you that if she puts a piece of fetid meat in the cupboard, though it does not touch the rest, all will be turned in the morning. The other day, when passing a butcher's shop in a large district, I found him hard at work with all his men. Having these perplexing questions on my mind, I walked in to hear what sort of disinfectant he used, and he said, "I use no disinfectant; I wash everything with soap and water every night—hooks, cleavers, knives, and everything; then I admit the meat. If I did not, it would all be turned towards the morning." I do not myself profess to understand or explain how it is that the approximation of bad meat to good will turn the good to bad, but so it is; and we can apply that fact, though I have no explanation of it, to show how contact with a fetid finger would lead to septicæmia in a woman.—*Lancet, June* 12, 1875, *p.* 828.

91.—ON PUERPERAL FEVER.

By Dr. W. Williams.

I have never met with a case of so-called puerperal fever existing as a disease *per se*. I have seen many cases of disease described as puerperal fever, with all the characteristics, which I have been invariably able to trace to a cause easily recognisable and capable in most cases of being recognised early enough for removal; and, as a matter of course, I do not believe that the disease is due to any special morbid poison. In answer to the second question, I am also decidedly of opinion that puerperal fever cannot be referred to any special disease, although the existing cause of puerperal disease may arise during the progress of any one of the diseases alluded to, and many others—that is, should they happen to be accompanied by any gangrenous or suppurating wound. Women are often confined with the diseases mentioned in the same room with them, and derive no injurious effects therefrom. Again, puerperal women exposed to those diseases, and who have not been previously attacked with them, will take them as other persons without any special action on the uterine organs. I could relate numerous instances proving both these statements did time permit. I shall consider the third, fourth, and sixth questions together; the one is so intimately connected with the others. I have stated what I believe the disease not to be; I will now state what I believe it is. Every case of so-called puerperal fever —I do not mean peritonitis and such like—is due to septicæmia, to septic contamination of the blood; and its injurious effects are first and most severely recognised in the wearied and bruised uterine organs and surrounding parts. The disease is then purely septicæmic. I agree in the main, on this head, with what fell from Dr. Graily Hewitt, with the exception of his terming the disease pyæmia. It is not pyæmia, and I consider that the calling of it so has led to much of the erroneous doctrines that have been promulgated. For instance, a female, three or four days after her confinement, is taken with what is termed puerperal fever, and rapidly sinks in a few hours. It is said she has died of pyæmia. A post-mortem is made, and no pus is found, only a quantity of bloody sanious serum, with a peculiarly sickening and offensive odour. This is poisonous matter. If the patient had not been prepared, as it were, by the powerful dose of septic poison in her system, and had possessed sufficient stength and vitality to form pus, she would have had a far better chance of recovery. I look on the formation of pus as a healthy effort of nature to surround and isolate the irritating poison. In fact, I do not believe that pus—laudable pus, as it used to be called,—whether in or out of the circulation, ever killed any one. It is only injurious when it becomes putrid. I believe that putrid animal matter acts injuriously on the puerperal female in two ways, and that the symptoms both vary in intensity and character. In both instances the septic poison enters the system, but in a different form, and as in the one case the poison is much more concentrated than in the other, so its effects are more overpowering and rapid. In the case of most intensity the poison enters the system in a state of solution; in the more chronic cases it enters as vapour. In the first case there is a breach of surface, generally in the vagina; in the other there is no breach of surface. When there is a breach of surface the septic poison comes immediately in contact with the fresh wound, and a dose sufficient to knock the patient down at once is taken into the circulation. In the other case a mass of putrid matter, it may be decomposing blood, is pent up in the uterus or vagina, and penetrates the mucous membranes and deeper tissues more slowly; in fact, it is a case of continuous poisoning. This form frequently terminates in puerperal mania. There is no such disease as puerperal fever; it is nothing more nor less than septicæmia, and is always due to the presence of putrid animal matter. Now this putrefaction may be caused in three ways: (1) by retention of portions of the placenta or blood-lots long enough for them to undergo decomposition; (2) by the bruising *and sloughing* of vaginal mucous membrane; and (3) where the septic poison *is conveyed to the* discharges of the patient, and by its presence sets up rapid

refaction in the lochia, so rapid that when once the fermentation is set the whole of the lochia appear to become putrid at once, like the action east, or wort, or dough. The first is to be prevented by not leaving any tion of the placenta or of blood-clot (as far as practicable) in the uterus or ina. It must not be overlooked that certain conditions of the atmosphere tend very materially to promote this putrefactive fermentation. This has n described by Sir J. Paget, who has pointed out that at times the nds of patients, not only in hospital, but outside, take on an unhealthy racter, and become gangrenous. Of course, should any portion of pla- ta or blood-clot be present, your first care will be to remove them, and h out the vagina, and, when necessary, the cavity of the uterus with e antiseptic fluid. You must not be satisfied with telling the nurse to do you must see her do it, or (as I generally do) do it yourself the first time. e treatment of the second form, when you have a slough, is the same—to inge out frequently with some antiseptic fluid. To prevent the third e every care must be taken to prevent any septic or putrid poison from ning in contact with the lochia. I have not time to point how this may best attained, neither is it necessary, as you have already heard all that be said on the subject as to isolation, ventilation, and the like. No me- d, however, has been pointed out, or even alluded to, in the course of the cussion by which the septic poison could be got rid of should it have at- hed itself in any way to the body or dress of the accoucheur or nurse. We ve more than one substance—one in particular—that will not tolerate the esence of putrid animal matter or septic poison; this drug is iodine, which, soon as it is brought into contact with septic matter, is converted into two rmless substances. Let any medical practitioner who has been in attend- ce on any case, whether a parturient female or any other, where there hap- ns to be putrid emanation, wash his hands in water into which he has ured tincture of iodine, and I will answer for it he has no septic matter der his finger-nails. Again, if he fancies that his clothes, hair, and skin e saturated with it, let him go into the water-closet (I mention that as the allest room in the house), place a few scales of iodine on a plate and put spirit-lamp under it, and he will soon find himself surrounded by a violet pour which will fall upon him in a shower of minute scales, from which he u only to protect his eyes. If he then carries with him any of the puerpe- l poison, my whole theory of the disease must be wrong. One thing I can sert, that in my own practice I have never had a case of fatal puerperal pticæmia since I have used iodine as an antiseptic, now more than twenty ars ago. Iodine is equally efficacious in warding off septicæmia in other rgical diseases. I have injected solutions of septic poison under the skin f guinea-pigs, and produced death by septicæmia; I have also injected some f the same solutions, into which I had dropped a few drops of tincture of dine, without producing any ill effects. It is needless to observe that the evention and the cure of this disease go hand-in-hand together. Should ny septic poison be present in the puerperal woman, wash her out again nd again with solution of iodine until the solution comes back the same olour as it was thrown up. The temperature of the patient will probably be 03° or 104°, and it will go down in a very short time to 98°. This I have witnessed since the present discussion began. The fifth question is as to acteria—a delusion and a snare! It is possible that the septic poison may e conveyed by them or by any other substance floating in the air that is alled harmless; that is all the harm they can do, as I take it. They live on this putrid matter as mites and maggots do on cheese, or vibrios on decayed potatoes during an epidemic of potato disease. In fact, I am inclined to think that they are present for the purpose of removing the poison, not generating it.—*Lancet, June* 12, 1875, *p.* 828.

92.—PUERPERAL INFECTION.

By Dr. JOHN CARRICK MURRAY, Newcastle-on-Tyne.

[The late Dr. Dawson, Lecturer on Midwifery, Newcastle-on-Tyne, recommended the following plan to Dr. Murray, for preventing run of puerperal fever in his practice. They had been together to see a case of puerperal peritonitis.]

Touch this poor woman with one hand only, and reserve the other for future cases; and, lest you should inadvertently neglect the precaution, you might put the mistrusted hand in a sling when called to a case. I warmly thanked the doctor, felt my weight of anxiety removed, nor have I ever had more than isolated cases of puerperal fever since. Before parting, I told Dr. Dawson that I had more than once observed my revered teacher, the late Dr. Patterson of Glasgow, with one arm in a sling; he must have adopted the same method. Undoubtedly, was the reply. Dr. Dawson's mode of preventing the spread of "childbed fever" would also be efficacious in cases of syphilitic infection. Had it been more in vogue, we might never have had to lament that distressing trial of Simpson and Wife *v.* Davey. That "puerperal fever" is infectious is quite granted in this district, for I have heard it styled "nail fever."—*British Medical Journal*, *May* 8, 1875, *p.* 609.

93.—ERYSIPELAS AND PUERPERAL FEVER.

By S. N. SQUIRE, Esq., Wivenhoe.

In Mr. T. Spencer Well's recent address on puerperal fever, the following sentence occurs: "A country surgeon attends a man who has erysipelas after a broken arm. He also attends a healthy woman in an isolated cottage in a natural labour. There is no puerperal fever in the district, yet this woman dies of puerperal fever. . . . . Such a history as this would have tenfold weight, as being free from numerous sources of fallacy and doubt."

On the night of February 11th last, my assistant went to attend a man who had fallen down and cut his head open over the occiput down to the bone. The wound was about an inch long. On the second night, it bled, evidently from a small artery, which he arrested by a compress of lint. On the 20th, the man was taken very ill. I myself went to see him, and found that he had been suffering from rigors. I examined the wound; the scalp was somewhat swollen. I carefully wash and dressed the part. The same evening, I was called to attend a woman in confinement (age about 37, fifth child), who had a natural labour. The next day I found that the man was suffering from erysipelas; it was running down over the forehead. On the 22nd, the woman had a chill, with all the symptoms of puerperal fever setting in. She died on the 27th; the man likewise died on March 1st. I took every precaution whilst attending other cases, and did not wear the same external clothing; so I did not infect any other lying-in woman. Early on March 3rd, I attended another woman (age 22, second confinement) who, on the day following, had all the symptoms of the previous case. I questioned the nurse, as she came from the village where the man died, whether she had been in the house. She informed me she had been there to assist, and left that place direct to go to the woman in labour. That case terminated fatally on the 10th. The child had erysipelas at the navel, which spread all over the body; it died on the 18th. A nurse, who was in almost constant attendance upon the man, had an abrasion on the nose; she had erysipelas on March 3rd, and died on the 7th. Whilst attending the man, I was also daily dressing two women, each for an ulcerated leg; both had erysipelatous inflammation of the leg. The husband of one, an old man, aged about 78, had erysipelas over the head and face, from which he got better, but died of exhaustion on May 6th. A son of the old man's master called to see him on April 25th; he had a slight scratch on *the septum of* the nose. On the 27th, erysipelas made its appearance, and *spread over the face,* from which he has now recovered.

To go back again to the first case. On March 13th, a woman, who had been several times to see the man (whose house was directly opposite her own) had a severe attack of erysipelas over the head and face; she recovered. A young woman likewise visited her, and at the same time had her ears pierced for rings; erysipelas affected them, and spread rapidly over the head and face; she recovered after a severe attack. During the interval of the two puerperal cases, I attended other women, who escaped infection. Thus, I had nine cases of erysipelas and two of puerperal fever, with six deaths, all to be traced from the first. In looking over my midwifery list, I find I had previously attended 1,139 cases without losing one. I have been in practice twenty-five years, and, during that time, I have only lost four cases, not including the last two I have previously mentioned. One died of inflammation of the lungs, three days after confinement; another (a turning case) of peritoneal inflammation, three weeks after confinement; another of scarlet fever; and the fourth of puerperal fever, the cause of which I could not discover. I generally make it my practice, if I have any contagious disease about, to visit my childbed cases first; the doing so, I think, is one reason why my death-rate is so low. Idiopathic erysipelas I consider not contagious; but traumatic, being caused be pyæmia, I think is, and I hold that it would be very unwise to attend a labour directly after visiting such a case. I have had many cases of the former kind, but cannot now remember ever losing one, nor have I seen that another person has taken it from one so affected.—*British Medical Journal*, *May* 22, 1875, *p.* 673.

ADDENDA.

94.—THE ANTISEPTIC PROPERTIES OF OILS AND FATTY MATTERS.

By Dr. JOHN DAY, Geelong, Australia.

[The following is a letter addressed to the Chairman of the Central Board of Health of Geelong, and is of considerable interest. We have extracted it from the Melbourne Argus, which was forwarded to us for that purpose.]

"I have for some time past been engaged in studying the chemical properties of fats and fatty or expressed oils, and find they all possess the property of spontaneously generating peroxide of hydrogen, a very powerful oxidiser and disinfectant, and of storing it up until they are brought into contact with any of those oxidisable substances for which it has an affinity, such as the products of decaying organic matter, and I have reason to believe, the poisons by which the spreading diseases are propagated; they then part with more or less of their peroxide, according to circumstances, and again begin to reproduce it, and also to store and condense it, unless kept in contact with something which it uses up as fast as it is formed. This process of formation, destruction, and reformation of peroxide of hydrogen in fats and fatty oils, may apparently go on without intermission for an indefinite period, a property which entitles them to rank as permanent disinfectants.

"My object on the present occasion is to draw the attention of the board to the results of an experiment which I have recently tried with a view to testing the disinfecting properties of olive oil on urine. I had previously ascertained that the addition of a very small quantity of oil of turpentine to urine would prevent all unpleasant odour for more than a year. On April 1 —rather more than two months since—I placed half a gallon of fresh urine in an open vessel, and added to it a very small quantity of olive oil—just sufficient to form a thin film on its surface, so thin that about one third of the urine has already escaped by evaporation. To-day (June 4), the urine, with the exception of a pretty copious deposit of mucus at the bottom of the vessel, is clear and normal in appearance and perfectly free from any offensive odour; and what strikes me as remarkable is that it has a very acid reaction—so contrary to what might have been expected.

"Now, it has occurred to me that if urine, which under ordinary circumstances so soon acquires an offensive odour and alkaline reaction, can be kept perfectly free from these objectionable changes by simply pouring a little oil on its surface, it is possible that the same practice might be found not only to correct the putrid odour and alkaline reaction which characterise the dejections of typhoid patients, but also to destroy by a process of oxidation the poison by which the disease is propagated. Olive oil would be too expensive for general use, but any cheap vegetable oil would answer the same purpose.

"The plan of using it which I would suggest would be to occasionally pour down the closet in houses where typhoid fever prevails a sufficient quantity of oil to fairly cover the surface of its contents."

—CROTON CHLORAL HYDRATE: ITS MODE OF ADMINISTRATION, THERAPEUTIC EFFECTS AND ACTION.

By Dr. J. C. Ogilvie Will, Assistant Surgeon Aberdeen Royal Infirmary.

laving for the last twelve months used croton chloral extensively, having
ıd it extremely beneficial in some forms of disease, and believing that it
not received that attention from the members of the medical profession
ch the success of chloral hydrate would have naturally been expected to
ıre for it, and which it also—standing on its own merits—most certainly
ırves, I am anxious to lay before them the particulars of a few of the
s in which I have employed it, in the hope that they may consider them
ciently successful to warrant their according it a trial.
efore doing so I may explain the composition of the preparation of cro-
chloral which I now generally prescribe. Messrs. Reid and Son, chemists
his city, made a very nice syrup for me containing two grains of croton
ral to a drachm of a mixture of glycerine and syrup of orange flowers,
ured by adding a very minute quantity of tincture of cochineal. This
tually conceals the taste of the drug, which is certainly to be desired, as
ems to me decidedly unpleasant, and when taken without some flavour-
ıgent it leaves a disagreeable, semi-acid taste in the mouth for a consider-
period after swallowing it. This preparation is permanent, a matter of
iderable moment, as croton chloral, though rather freely soluble in warm
s is only sparingly so in cold, and when first employing it I was disappoint-
find that a mixture which was perfectly clear when first made, soon after
me clouded, and threw down a copious deposit of crystals on becoming
e cold. It is, as stated by Wallich and Diehl, freely soluble in alcohol,
a strong tincture can thus be prepared; but, unfortunately, on the ad-
n of water separation soon takes place, the liquid first presenting an oily-
appearance, and soon after depositing crystals. Therefore, if a strong
tuous solution is prescribed directions must be given that water in the
ortion of at least a drachm to each two grains of the croton chloral
ld be added before the dose is taken, else the changes I have indicated
ensue, and some of the crystals are pretty sure to adhere to the spoon or
, or to remain in the patient's mouth, an occurrence certainly not desir-
as the taste of pure croton chloral is far from agreeable.
se 1.—Mrs. T., æt. 30, suffering from severe facial neuralgia, occurring
r night about ten o'clock, was ordered three grains of croton chloral:
an hour after the pain disappeared, and she slept well, which she had
lone for some nights before. On the four following nights the pain re-
ıd at the same hour; three grains again taken with similar effect. On
ixth night pain not nearly so severe. On the seventh still less so, after
h it did not return. On asking the patient if the mixture made her
y, she replied, "No, the pain left me, and then I soon went to sleep."
ıe time when this statement was made to me I had not seen Liebreich's*
r on croton chloral, but I have since found that it is in accordance with
xperience, viz.,—"that in some cases of tic douloureux the remarkable
omenon is exhibited that pain ceases before sleep sets in."
se 2.—Mrs. S., æt. 43, a somewhat hysterical female, suffering from
a-orbital neuralgia, appearing every night about eleven o'clock. To take
ains on appearance of pain, to be repeated in two hours if necessary.
after the first dose pain abated considerably; after the second it disap-
ıd entirely, and did not return for some nights; when it did, the medi-
again acted as on the former occasion.
se 3.—Mrs. W, æt. 31, had been for some days attacked by intense
in her right temple, commencing soon after she arose from bed, and
nuing with more or less severity during the greater part of each day.
n I was called to her it was more severe than it had ever been before.
was directed to take 3 grains every second hour till relieved. Six
ıs sufficed, and when I visited her on the forenoon of the following day

*British Medical Journal, December 20, 1873.

she was quite free from pain, and said that soon after the second dose she felt so well that she had been able to serve her customers "just as if nothing had ever been the matter." In this case the truth of Liebreich's statement already alluded to was well affirmed.

Case 4.—S. M., æt. 5. Mrs. M., the mother of this child, stated that about seven o'clock of the evenings of the four preceding days the child complained of great pain in the left side of her head, that from that hour it gradually increased, the child becoming so much excited that she feared a fit would ensue. Ordered 40 drops of the syrup on the appearance of pain, to be repeated every half hour till relieved. Two doses sufficed, and the child went to sleep. Quinine to be given twice a day. The syrup was given for five days, and was not afterwards required.

Case 5.—Mrs. H., æt. 25, facial neuralgia, pain occurring about eleven a.m., very severe. Ordered a teaspoonful of the syrup every half hour. After three teaspoonfuls pain ceased, but recurred at same time next day, when three doses were taken with a like result. Prescribed 4 grains of quinine twice a day, and syrup if required. During two following days it was required, but a smaller quantity proved sufficient, and after that, as the pain was only slight, the syrup was discontinued.

I might multiply examples of the efficiency of croton chloral in relieving neuralgia of the face and head, but I must content myself with the foregoing typical cases. In may cases it is necessary to administer quinine or phosphorus for the cure of the disease, the croton chloral being given merely to relieve the pain; but this is surely of itself a sufficient reason for its exhibition. The largest quantity I have found necessary was 14 grains, taken in two hours; generally a very much smaller quantity has been all sufficient, and I agree with the opinion expressed by Dr. Burney Yeo, that small frequently repeated doses is the best mode of administering it, and with this view I would suggest a teaspoonful of the syrup every half-hour till the pain disappears. Were this not found rapid enough, a larger quantity should be prescribed on the next reappearance of pain.

Case 6.—A weakly old man was nearly every night tormented for some hours by insufferable pain along the course of the right ulnar nerve, most marked at the elbow. Ordered 3 grains of croton chloral, to be repeated in an hour. Pain somewhat subsided after second dose, but not sufficient to permit of sleep. Dose increased to 5 grains, to be repeated in an hour: pain much less after first, and disappeared completely a short time after second dose. On following nights 5 grains sometimes answered; on others 10 grains were needed. The man stated that after taking the medicine it seemed to him as if "a fight was taking place between the medicine and the pain, but that the medicine always obtained the victory," and that he did not experience any of the disagreeable effects on the following mornings which he had before been subjected to after taking opium.

Case 7.—Mrs. W., æt. 70, a person whom I had some years before attended when suffering from sciatica, had been attacked between nine and ten o'clock on each of the three previous nights by excruciating pain, commencing on the outer side of her left foot, and extending up her leg and thigh. The pain lasted for three or four hours, and then gradually left; it was so severe that she, though well accustomed to suffering, was unable to repress her feelings, and gave vent to them in loud cries. Ordered 2 grains, to be repeated in two hours; no effect. Next night, 5 grains on appearance of pain; relief soon followed, and the patient slept soundly. On the three folowing nights, the pain was bearable, so the medicine was not taken, but after this the pain again appeared, and a 6-grain dose was taken, and soon after its reception it was quite allayed. Before I saw the patient she had taken a large dose of a mixture of chloral hydrate and bromide of potassium, which I had on a former occasion ordered for her, but without the slightest benefit.

I may here mention that in lumbago I have twice prescribed croton chloral, but it proved useless in both.

Case 8.—A stout, robust man, suffering great agony during the passage of a renal calculus, received great relief from croton chloral, which was substituted for opium, and which he had been taking, and he was rendered com-

paratively easy by being kept under its influence until the calculus reached the bladder.

Case 9.—M. B., æt. 4. Whooping-cough. Mother said that she had been obliged to rise and attend to her "nearly every half hour" during the previous night, on account of the frequency and severity of the fits. Ordered 15 m. of syrup at eleven o'clock: child passed a fair night; fits frequent, but not nearly so much so as on previous night, and much less severe. Cough returned with former severity at six a.m. Next night, 15 m.: child slept for three hours; after that, cough exceedingly frequent, but spasm somewhat lessened. Next night, 15 m. three times during the night; slept well; little cough. The same treatment was continued, with the adition of 8 m. occasionally during the day, and the cough steadily decreased.

Case 10.—M. D., æt. 5. Whooping-cough. Paroxysms exceedingly frequent and severe, especially during the first hours of night. 20 m. of syrup at bed-time. Attacks reduced to half the number of former night; child slept well, though wakened occasionally by the cough; but she always fell asleep on cessation of fits of coughing, which she had not done before, as the spasms, from their severity, rendered her excited and wakeful. This case went on much as M. B.'s. The diminution of the spasm was well marked from the first night the syrup was given. In other cases of whooping-cough where I have employed croton chloral I have had results similar to those above narrated.

Case 11.—Mrs. S., an elderly lady, the subject of a slight attack of pleuritis, took 3 grains every fourth hour, with a double dose at night, and expressed herself as much relieved, the cough being less troublesome, while under the influence of the croton chloral, and after the 6-grain dose at bed-time she slept quietly till five a.m., coughing occasionally, but dropping off to sleep immediately afterwards. The medicine was continued for five days, when it was discontinued during the day, but the nightly draught was still administered, by which a quiet night was insured, though the patient was much troubled by dreams.

In the night-cough of phthisis I have found much benefit from the use of croton chloral. The following is a typical case:—

Case 12.—S. W., æt. 33, complaining of distressing paroxysms of coughing, generally appearing in the early hours of the morning, and continuing with such severity that he never went to sleep after it fairly commenced. Ordered a teaspoonful of the syrup every morning. He called three days after to tell me that the cough had been much lessened, and that he had slept throughout the morning. This patient has now taken the syrup for several months, sometimes one, sometimes two teaspoonfuls, and he says he always derives benefit from its use. I have another case of the same nature under my care, and he has now taken the syrup for ten weeks with marked effect.

In the description of the foregoing cases I have endeavoured to state as concisely as possible the effects following the administration of croton chloral when given for the *relief of pain*; I have therefore purposely omitted the other remedial measures adopted. In the cases of whooping-cough no other treatment was employed.

Mode of Action.—Engel states that under the influence of caustic potash croton chloral breaks up into allyl-chloroform and formiate of potassium, but that allyl-chloroform is extremely unstable, and decomposes rapidly into hydrochloric acid and bichlorallylene, and that the hypnotism induced after the ingestion of croton chloral is due to the product last mentioned. Leibreich also expressed his conviction that, unless when very large doses of croton chloral were given, its hypnotic effects were due to the influence of bichlorallylene. The potash necessary for effecting the decomposition of croton chloral after it has entered the system is probably obtained at the expense of the alkali of the albuminous substances of the body. This view was brought forward by Liebreich, and more recently by Personne before the Paris Academy of Sciences, as the source whence the alkali required for the decomposition of ordinary chloral is got, and, though the products of decomposition of *chloral hydrate* and croton chloral differ, the origin of the

material required is in all likelihood the same. Further, regarding the effects observed after the administration of croton chloral, Engel points out the similarity of results in the experiments conducted by Liebreich with bichlorallylene to those seen after the use of croton chloral, and this he brings forward as an additional proof of the correctness of his inferences; and he also states that, comparing the effects of chloroform and chloral on the one hand, and bichloride of ethylene and bichlorallylene on the other, he considers himself justified in asserting that, while the trichlorinated substances act upon the brain, spinal cord, and heart, the bichlorinated substances act only on the brain and spinal cord. Liebreich's statement "that croton chloral rapidly produces slumber similarly to ordinary chloral, but without its use being followed, as in the case of the latter, by lowering of the pulse and respiration," is strong testimony in favour of Engel's views. If these conclusions be correct—and, coming from those who have so carefully investigated the action of this drug, one can hardly but accept them—a wide field, in which other hypnotics are inadmissible, is opened up where croton chloral may be with safety and advantage employed. I may add that I can, from my own observations, substantiate the correctness of Liebreich's statement regarding the pulse and respiration.

In conclusion, I may state my decided conviction that, of all hypnotics, croton chloral has the least troublesome sequelæ.—*Medical Press and Circular*, *May* 12, 1875, *p.* 400.

96.—A METHOD OF INCREASING THE SOLUBILITY OF SALICYLIC ACID.

By Dr. H. Bose, Berlin.

An objectionable property of the new antiseptic, and threatened rival of carbolic acid—salicylic acid— is its insolubility in cold water, so that it has been, till now, impossible to obtain a stronger solution of it than 1 part to 300; while the alcoholic solution and the pure acid are too irritating to be applied directly to a wound. Those, therefore, who are specially interested in comparing the antiseptic properties of the two acids, will be glad to know that the solubility of the latter is enormously increased by the addition of borax to the water, so that as much as ten parts of the acid can be dissolved in 100 parts of water, if eight parts of borax be present. This discovery we owe to Dr. H. Bose, assistant in the Surgical Clinic at Berlin, who has contributed a paper of much interest to the Berliner Klinische Wochenschrift (July 12), to which we are indebted for the following details. The solution should be made by first dissolving the borax with the aid of heat, and then gradually adding the salicylic acid to the boiling fluid. Since commercial samples of both these drugs are not chemically pure, a small amount separates, and requires to be filtered off on cooling. The filtrate is a clear yellowish or light-brown fluid, according to its concentration. The proof that the addition of borax does not convert more than a part of the salicylic acid into salicylate of soda—a salt devoid of antiseptic properties—is easily shown; for if we dissolve 6·9 parts of the acid in 100 parts of boiling water, and then add 2·89 parts of bicarbonate of soda, the carbonic acid in the latter is set free, while the soda combines with the salicylic acid, and on cooling there is such an abundant deposition of the excessive acid that the whole liquid becomes nearly solid, owing to the formation of crystals. Now if the whole be reheated until the acid is completely dissolved, and then 3·58 parts of boracic acid added, no deposit of any kind occurs on cooling. The most suitable strength in which the above solution can be used for direct application to wounds, is, according to Dr. Bose's experience, one which contains from 2½ to 5 per cent. of salicylic acid, and 2 to 4 per cent. of borax. Solutions containing more than 5 per cent. of acid are too irritating, and give rise to a very abundant capillary hemorrhage if applied to the surface of a fresh wound. *Dr. Bose* speaks highly of the result obtained with the boro-salicy-

lic dressing in a number of cases of removal of small tumours. The operations were all performed without the spray, and only the sponges and forceps used were cleansed antiseptically with the above solution. The wound was thoroughly washed with the same liquid, and then a thick layer of salicylic wadding, also soaked with it, was laid on its apposed edges, so as to reach several fingers'-breadths beyond them, and fixed by means of a bandage; catgut was used to tie any vessels requiring ligature. In those cases where the edges of the wound could not be accurately brought together, Dr. Bose put in catgut sutures, and then filled the spaces between the edges with the salicylic solution by means of a small syringe, and applied the wadding over all. The greater number of the cases thus treated healed by first intention, without the formation of a drop of pus.

Among a number of casual injuries treated with the above solution, one especially deserves to be briefly described. A workman managed to cut into the back of the metacarpo phalangeal joint of the left forefinger with a saw, so as to divide the extensor tendon, to open the capsule of the joint obliquely, and to tear the cartilage of the head of the metacarpal bone with the teeth. He applied for relief half an hour after the accident. Dr. Bose tied one artery, which was spurting, with catgut, and then kept the wound filled for several minutes with the solution of borax and salicylic acid. He then united the ends of the tendon with four catgut sutures, and finally closed the wound with other sutures of the same material. It was then dressed as above described, and the extended fore and middle fingers were bandaged together on a splint, which only fixed the finger-joints, and did not interfere with the movement of the hand. The patient was kept in bed, but, though he was slightly feverish on the first three days, there was no pain or swelling in the hand to necessitate an examination of the parts, and the dressing was not removed for *fourteen* days, when the wound was found completely healed. Dr. Bose concludes his paper by stating that he has as yet no experience of the value of the boro-salicylic acid solution in dressing large wounds, and that he has not found it invariably successful in the case of small ones, but he thinks that the frequency of small wounds in practice, the simplicity of the method, and the facility with which healing by first intention can be obtained by it, render it worthy of a passing notice.—*Medical Times and Gazette, July* 24, 1875, *p.* 99.

97.—ON THE USE OF NITRITE OF AMYL IN VARIOUS FORMS OF SPASM, AND ON ITS VALUE AS AN AID TO DIAGNOSIS.

By Dr. S. Weir Mitchell, Philadelphia.

Dr. Mitchell has for some time entertained the conviction that nitrite of amyl would be a suitable remedy in epilepsy, because it rapidly induces fulness of the vessels of the whole head, and thus would counteract the condition of vascular spasm which characterises the outset of the epileptic attack. The cases, however, are rare in which the remedy can be employed, because the fit comes on so suddenly as to prevent the due administration of the nitrite, but in certain instances the patient has a succession of fits within a limited space of time, and, being then in bed, is so placed as to admit of the trial of this plan. The first case in which Dr. Mitchell was able to test the value of the remedy occurred in 1872, and the result was quite successful. The case was one in which the disease was caused by sexual abuse, and various remedies had been employed in vain, but, as a last resource, Dr. Mitchell gave the patient three or four drops of nitrite of amyl, and directed him to inhale it by putting the open phial which contained it up one nostril while he closed the other nostril and then made a few full inspirations. At the second trial of the experiment the patient felt his face flush, the carotids beat violently, the head felt full, and the spasm being thus caused to cease, the impending *attack was cut short* for the first time in the course of the epi-

leptic seizures. On subsequent occasions the attacks were arrested in a similar manner, and Dr. Mitchell reports that for the last two years and a half there have been only seven fits, or rather only one, for all the rest have been cut short by the nitrite. Several other cases are given in which the results were the same, and although Dr. Mitchell does not allege that the drug has any power to prevent the return of the fits, he has no doubt of its efficacy in arresting the actual convulsion. In reference to the aid given to diagnosis by the use of the nitrite, Dr. Mitchell writes with some hesitation, but he thinks that in some doubtful cases of cerebral disease the nitrite may help to clear up the difficulty. When, for instance, the malady is truly epileptic, the nitrite of amyl may arrest the fit in the manner already described; but when the disorder is of the congestive type, the drug may prove useful in settling the question of its nature by reproducing the train of symptoms and thus showing its real character.—*British and Foreign Medico-Chirurgical Review, Oct.* 1875, *p.* 450.

98.—ON THE RAPID RELIEF OF NEURALGIA.

By Dr. Spencer Thomson, Torquay.

[Innumerable are the remedies for neuralgia, but we think with Dr. Spencer Thomson that gelseminum has not had its fair share of use. We have several cases which quite confirm the opinion subjoined of this remedy.]

As one of the newest of the remedies, I would first allude to one which is much too slowly making its way into the domain of practical therapeutics; I allude to the recently introduced "tincture of Gelseminum sempervirens," or yellow jasmine. In my presidential address delivered before the South-Western Branch of the British Medical Association, in 1874, I alluded to this remedy as having proved very successful in my hands, and in a paper I read this year at the Plymouth meeting I was able to state how fully it had fulfilled my expectations during the twelve months that had elapsed since my former notice of it. Directly or indirectly it had been used by me, or by my authority, in at least forty cases to which it was applicable, and with almost constant success. In using the word "applicable," I do so in accordance with my own experience that the remedial power of the gelseminum seems confined to those branches of the trifacial nerve supplying the upper and lower jaw, more particularly the latter, and more especially when in either jaw the pain is most directly referred to the teeth or alveoli; indeed, I can scarcely recall an instance of the above in which relief was not speedily and thoroughly given. The usual expression of the patient has been, "It acted like a charm." In illustration I give one case.

On Sunday afternoon, June 20th, the housemaid of a friend, a retired medical man, came to me with a note from her master, stating that she had been suffering from agonizing pain, of what was thought to be toothache, for six-and-thirty hours. Nothing gave relief, and no dentist could be found to remove the only suspicious tooth. I sent her home with a bottle of gelseminum tincture, which I kept for home use, desiring that she should have twenty minims at once, and twenty more within two hours if not relieved. Her master sent me a note in which he stated that the patient had experienced immediate relief.

The above case was not one of distinct toothache, but rather of pain affecting the alveoli generally of the affected jaw. Still, even in toothache seated in one tooth, the remedy gives relief, provided, of course, abscess is not actually in formation. I have observed above, that, according to my own experience, the beneficial effect of the gelseminum is confined to neuralgic pain of jaws generally, and of teeth and alveoli more particularly; and a short paper, in the Practitioner for August, 1875, by Dr. Gamgee, of Birmingham, supports the view. In September, 1875, there were published some *cases of other* neuralgias, even one of sciatica, in which cure was effected, *under the care of* Dr. A. Jurasz, of Heidelberg. Should the remedy indeed

prove generally useful in neuralgia, it will of course give it additional value in our materia medica, but at present it has gained no such position, either according to my experience, or, as far as I can learn, that of most others.

In the notices I have met with on the use of the gelseminum, the doses quoted seem all too small. I now almost invariably prescribe, for an adult, twenty minims of the tincture, as a first dose, to be repeated any time after an hour and a half if relief is not given. I have rarely had to order a third dose, and I have never found any inconvenience result from the larger doses. In one instance, a gentleman who, unadvisedly, took thirty minims at once, and immediately afterwards went out driving, told me he experienced for an hour or two some uncertainty of vision when guiding his horse. A severe attack of neuralgia of the jaw was, however, cured by the one dose, and did not return. One young lady, to whom I gave two twenty-minim doses during the night for a severe neuralgic attack, more particularly of the tempo-ro-auricular branch of the inferior maxillary nerve, complained of a little heaviness next morning. In this case little if any relief was given; but the teeth and alveoli were not implicated, and it is only when these are that complete relief can be calculated on according to my own experience. The above case was at once cured by the solution of phosphorus, to be noted presently.

As further illustration, I may mention the case of a lady who was under my care last winter for local disorder, but who also suffered severely from neuralgia, attacking at one time the lower jaw and at another the orbital and frontal nerves. The gelseminum invariably relieves the maxillary pain, but has no effect whatever over the frontal. For this, however, for a long time at least, I found a most efficient remedy in phosphorus given in the liquid form. The form I have used is that given by Ashburton Thompson in the Practitioner for October, 1873. It is taken without repugnance, rarely causing disorder of the stomach or eructation, and, what is most important, keeping perfectly. One of the cases I have mentioned was treated with a preparation which had been made four months at least. I have found a twenty-minim dose, equal to one thirty-sixth of a grain of phosphorus, give rapid relief, and, what is important, independent of locality.

Even phosphorus, however, we know, will, after a time, lose its power in some obstinate cases of neuralgia—at all events its power of giving rapid relief; and then it is that the invaluable hypodermic administration of morphia comes to our aid. This remedy, and its mode of administration, are too well known to require comment here; but it is far from being as generally employed as it ought to be. This, perhaps, is due to various causes, but of these I believe the principal are—the means of administration not being always readily available, and the objection of patients to the pain consequent upon the use of coarsely constructed instruments. The first of these objections I have endeavoured to meet by the use of a very portable hypodermic apparatus, enclosed in a metallic case, with ample supply of needles, and the great desideratum, an always moist and efficient piston; and by always carrying a supply of Samson's gelatine discs, as made by Messrs. Savory and Moore. The second objection is met by the use of very fine steel needles only, as made for me by Mr. Hawksley, of Oxford Street. The discs, which contain one-sixth of morphia in each, are a very safe and efficient dose for most cases, although in some it may be well to begin with a less amount, and in many it may be advisable to increase the dose considerably—half a grain, or even double that amount. I may here give it as the result of a very large experience in the hypodermic administration of morphia, that concentrated solutions are the reverse of advantageous. In the first place, they are not so safe as the more dilute; and, in the second, they do not act so quickly and agreeably. The usual strength I employ is one grain of hydrochlorate of morphia in forty minims of water, rarely in thirty. The slight increase of bulk is of no consequence, and in administrations I can count by the thousand I have never seen the slightest bad consequence, in the way of abscess or otherwise, result to the patient.

With morphia, and occasionally—but only occasionally—atropia, to use hypodermically; *with phosphorus* in solution; with gelseminum, aided at

times by the ordinary external appliances, such as heat, or freezing if need be; aconite, and chloroform,—one ought to feel fully prepared to meet and subdue at the time most cases of neuralgic pain, and, indeed, of pain generally—*Lancet, Nov.* 6, 1875, *p.* 660.

99.—THE COMBINED ADMINISTRATION OF CHLORAL, MORPHIA, AND ATROPIA.

By Dr. Bartholow.

Dr. Bartholow says that the great mass of narcotic remedies are administered conjointly without an adequate conception of the part which each one plays in the results produced. Thereupon he made some experiments chiefly by means of the hypodermic syringe. One drachm of chloral to four of water gives a solution of sufficient density, and 30 minims contain seven and a half grains. Into this solution was put one grain of sulphate of morphia, and into another solution was put six drachms of chloral, four grains of sulphate of morphia, and a quarter of a grain of atropiæ sulphas in two ounces of water.

A solution of chloral injected under the skin causes a smart burning sensation, lasting from five to fifteen minutes, and usually leaving an induration which slowly disappears. This does not, however, seem to tend to suppurate. Absorption quickly takes place, for chloral being a crystalloid, diffuses easily into the blood. It causes a feeling of frontal distension, some headache, and vertigo, and drowsiness, supervening in from ten to twenty minutes, like that produced when chloral is taken by the mouth. One-fourth to one-half the quantity necessary to produce sufficient effect is required by the subcutaneous areolar tissue as compared to stomach administration; and when combined with morphia and atropia the quantity required need be very small.

Chloral and atropia do not act on each other chemically. Rabbits bear chloral very well indeed, but they are rather unsusceptible to the action of atropia when taken into the stomach, whilst the hypodermic injection of the drug is followed by the usual physiological effects. Atropia prolongs the chlora narcosis several hours. Thus, a rabbit to which Dr. Bartholow gave twenty grains of chloral subcutaneously remained in a state of narcotism six hours; when one grain of atropia was added, the narcotism lasted eight hours. In various observations he made on himself with chloral and atropia combined, Dr. Bartholow observed the following fact: That the excitant action of the atropia hindered the occurrence of the chloral narcosis, but sleep usually ensued after two hours, and was always profound. On the following day the pupils were dilated, the mouth dry, and there was more or less giddiness and headache. These effects were produced by eight grains of chloral and 1-94th of a grain of atropine. The effects of atropine continue much longer than those of atropia.

With regard to chloral and morphia, the latter substance in the rabbit deepens in every way the effect of the former. On his own person, Dr. Bartholow found that when he took morphia alone there was a great deal of discomfort produced—nausea, vomiting, vertigo, headache, and wakefulness. When combined with chloral, the nausea and vomiting are lessened, but not prevented, and sleep is produced. Chloral does not prevent the unpleasant after-effects of morphia—nausea, loss of appetite, constipation, headache and vertigo—for these symptoms are experienced on waking from the chloral-sleep. Those who bear morphia well are also favourably affected by a combination of chloral and morphia, but in man as in rabbits, morphia increases in the whole sphere of its influence the chloral narcosis. As, however, morphia is synergistic to chloral, a dose of the latter far short of lethal activity will be sufficient in most cases when the former is combined with it.

A combination of chloral, morphia, and atropia presents the greatest ad*vantages from the* physiological and therapeutical point of view. Dr. Bar-

tholow has made numerous experiments on his own person in this matter. Chloral causes sleep, morphia relieves pain, and atropia prevents or lessens the depression of the heart and respiration caused by the agents associated with it, whilst it certainly contributes to the cerebral effects of both. He found that the action of the combination was much more agreeable than chloral or atropia or than chloral and morphia. Sleep followed more promptly, without being preceded by nausea and excitement, and the after-effects were either absent or slight.

Practical Conclusions.—Dr. Bartholow hence concludes that the combination of chloral, morphia, and atropia, in the relative proportions he advises, used subcutaneously or by the mouth, is extremely well adapted to the treatment of insomnia in certain of its forms. In all cases in which pain is an important factor in the causation of wakefulness, the combined action of chloral, morphia, and atropia is much more effective than either agent alone. He cannot too strongly urge this combination in cases of insomnia in the subjects of fatty and dilated heart, and in the irritable heart of the chronic smoker. The combination of chloral and bromide of potassium is ill-advised in such cases. When a suspicion of heart disease exists, it were better to use morphia and atropia than chloral alone.

Pain.—For the relief of pain, says Dr. Bartholow, no one denies that the hypodermic injection of morphia is the most effective agent we possess. On the score of propriety and safety some persons object to it. The hypodermic injection of chloral, morphia, and atropia, barring the greater pain it gives, is more agreeable in its effects, and it seems to him, more permanent in its results. He has used this combination in neuralgia of the fifth, of the brachial plexus, of the lumbar nerves, of the sciatic nerve, and coccygeal nerves, and about the seat of the painful spinal points in visceral and other neuralgias, and in spinal irritation. Whatever may be said in its favour, the remote injection of anodyne for the relief of pain is not so effective as application to the painful points. It is familiar to all how, when the parts swell about a painful nerve, the pain ceases.

The effects of irritant injections about the site of neuralgic pains are sometimes simply marvellous in the relief they procure. Most of the pain-relieving agents, when applied to the nerves themselves, interrupt the transmission to the sensorium of the painful impression. From these considerations we obtain a useful lesson as to the utility of localised injections for the relief of neuralgia. Dr. Bartholow mentions that he has applied this method with success by the "deep injection of chloroform," and also has used with excellent result the deep injection of chloral, morphia, and atropia.

In neuralgia of the fifth nerve, the injection may be inserted deeply underneath the cheek or lips about the situation of that division of the nerve which is painful. In sciatica the point of the needle should be made to reach the vicinity of the nerve. But he especially calls attention to the good effects of this practice in the cases of that intractable disease *coccydynia*. In this form of severe pain, the needle should be passed down to the coccyx so that the solution may be made to diffuse over the whole surface of the coccyx. He does not meet many cases of this disease, but in two, the brilliant results which followed justify the most sanguine expectations of the utility of the practice. And so in spinal irritation, and in visceral and parietal neuralgia with points of spinal pain and tenderness, these deep injections are of greatest service.

The hypodermic injection of chloral, morphia, and atropia may, he thinks, be used in minor surgical operations.

In recent torticollis and in lumbago it affords lasting relief. He has witnessed astonishing results from the use of chloral and morphia in the true collapse of cholera. The injection hypodermically of the combination of chloral, morphia, and atropia is of great use occasionally in spasmodic asthma, whooping-cough, and laryngismus stridulus. In angina pectoris, hepatic and renal colic, spasm of the sphincter of the bladder, &c., these agents combined produce results to which they are quite inadequate when used separately.—*Medical Press and Circular, Feb.* 24, 1875, p. 170.

100.—LEAD POISONING BY DRINKING WATER.

By H. C. Bartlett, Esq., Ph.D., F.C.S.

The prevention of lead-poisoning from its contamination of drinking water must be held to be one of the most obvious duties, both of municipal and sanitary authorities, and of all persons drawing their supplies from private wells. Water companies are morally bound to ascertain from time to time that their water will not attack lead, or that that metal does not come in contact with it throughout their entire system of mains and private supply pipes and cisterns. In the same way no private well can be considered safe until the action of its water, if any, be most carefully determined at various periods of the year. I have always found that the increase of certain salts in shallow well waters during autumn conduces to a much larger solution of lead than at other seasons.

The new adaptation of a pure tin rose and end to lead immersion pipes, which are lined and coated inside and out with a good substance of solid tin, obviates much of this danger, and I feel strongly that no unlined lead piping should be permitted in any case where the water supply is liable at any time to dissolve or corrode unprotected lead, as unfortunately so frequently happens. Edinburgh is happy in being but little subject to this danger, as I have never found more than ·01 gr. per gallon in the water supplied to this town. But while urging the selection of proper water as far as is humanly possible at the source, and deploring the indiscriminate use of lead in pipes and cisterns, I should add that a further precaution may be taken in the domestic household. A very singular and efficient filter has been lately constructed out of the coke of the Torbane Hill mineral combined with porous calcium carbonate. This effectually removes every trace of lead from water percolated through it, including the solutions of all the salts of lead. I have alluded broadly to the requisites of wholesome drinking-water as it should be supplied to the houses of the consumers; but one great reason for the comparative immunity with which so much bad water is partaken arises from the circumstance that much less water is drunk at table as it is drawn from cisterns and wells than is consumed after being subjected to prolonged boiling. Take the constituent water of any article of food, be it liquid or so-called solid, and it will be seen that at least nine-tenths of the total moisture ingested has been strongly heated. It is only when the crystal caraffe, filled with refreshing and pellucid spring water, comes to table that we encounter the greatest risk from imbibing its untempered dangers. On the other hand, the common aërated waters so largely sold and drank are found by analysis to be frequently contaminated with the decomposition of every description of foul organic matters. If to these be added the dangers of impure chemicals and a very general increment of carbonate of lead, held in solution by the excess of carbonic acid, we shall perceive the imperative necessity of being well assured of the wholesomeness of all waters admitted to the table.

Leaden generators, pipes, and joints are simply stores of poison for certain solution in aërated waters made in them, and the extent to which these waters are rendered toxic by their means must be hardly credible to those who have had less than the most extended opportunities of testing the lemonades, soda, and seltzer waters of commerce.

None of the natural mineral waters, except those emanating from sources of exceptional purity, are admissible, and these, as must every manufactured aërated water, require to be bottled under conditions which preclude the dangers of organic matters, lead, and all other chemical impurities.—*Medical Press and Circular, Sept.* 8, 1875, *p.* 185.

11.—THE DANGERS OF CHLOROFORM, ETC., AND THE NITRITE OF AMYL.

By C. Bader, Esq., Ophthalmic Surgeon, Guy's Hospital.

ome years ago, when nitrite of amyl was first used at Guy's Hospital, Dr. dhart and myself studied its effects, when taken internally, upon the odvessels in the healthy optic disc and retina. The effect is as rapid as it triking. Three or four seconds after taking three drops of the drug on ar the bloodvessels of the retina (arteries and veins, but especially the ns) become enormously dilated and gorged with blood, leaving no doubt to simultaneously existing cerebral hyperæmia, with greatly accelerated ulation of blood.

ately, after observing upon myself the effects of inhalation of the vapour the nitrite of amyl, it occurred to me that in cases of faintness or of defective athing or heart's action, while under the influence of an anæsthetic, nitrite myl might be of use. A few cases will show the encouraging effects of s agent.

Case 1.—Given a mixture of alcohol, ether, and chloroform. Young man, ilocephalic, inherited syphilis; iridectomised on both eyes; suddenly be- me pale, deeply insensible, with pulse and respiration very defective. nt, with a few (three) drops of nitrite of amyl, was placed over nose and uth. In two or three seconds a deep inspiration, followed by others, shed face, quick pulse, and return of sensibility, were observed.

Case 2.—Given chloroform. A boy, pale, fat, blue lips and cheeks, be- me suddenly very faint (blue lips, blood turning black, breathing very im- rfect). The same quick result, with vomiting, followed the inhalation of e nitrite of amyl (three drops).

Case 3.—Given chloroform. A middle-aged woman suddenly became blue the face and stertorous (tongue falling back). Lint, with ten drops of ni- ite of amyl, was placed over mouth and nose. In a few seconds the blue- ss and stertorous breathing gave way to good colour, regular breathing, d sickness and vomiting, though no food had been given for several hours. The most striking effects of the nitrite of amyl were the quick restoration f breathing, of a good colour, and the rapid appearance of sickness. It re- ains to be shown whether injection of this agent will have a still better fect.—*Lancet*, *May* 8, 1875, *p.* 644.

102.—THE TREATMENT OF CHLOROFORM POISONING.

By S. Messenger Bradley, Esq., Manchester.

Dr. Hardie's recently reported case has gone a long way towards destroying the proud *prestige* of ether, and towards showing that its superiority over other anæsthetics is purely ethereal. We have still to search for a safe anæsthetic, but, in the meantime, human beings will continue to imbibe the more or less lethiferous vapours now in vogue, and it therefore becomes important that a concerted plan of action should be agreed upon when danger arises. As matters stand now, one man trusts to galvanism either of the heart or of the phrenic nerves, another puts his faith in artificial respiration, a third is content with flicking the skin with a wet towel in the hope of returning the expiring vital spark, another throws all his energies into opening the windows and pouring brandy down the victim's throat. Now, under the plan of inversion, introduced by Nélaton, recoveries have been effected after a much longer period of apparent death than under any of these; and it certainly is only right to give this method a fuller trial, and to resort to it on the first threatening of danger, and not after a number of other things have all been tried in turn and in vain, and when it would be as rational to attempt to resuscitate an *Egyptian* mummy.

Though the following case presents no novel feature, and, indeed, is altogether less striking than the cases reported by Dr. Campbell, Dr. Marion Sims, and Sir John Rose Cormack, still I think it worth recording, because it serves as well as another to redraw attention to this important subject, and because it may stimulate those who have opportunities experimentally to determine, first, the condition of the brain in cases of chloroform-poisoning; and, second, the comparative value of artificial respiration in the horizontal and the inverted position. A boy, about eleven years of age, who had previously taken chloroform without any bad symptom, was narcotised in one of the surgical out-patient rooms of the Manchester Infirmary for the purpose of having a large nævus ligatured. Before completing the operation, my attention was drawn to the patient, when I noticed that respiration had ceased; his teeth were closed, there was frothy mucus at the angles of the mouth, the lips were blue, the pulse could not be felt at the wrist, nor, on placing the ear to his chest, could any action of the heart be detected. Several students were present, and, at my request, one of them held the boy up by his heels, while I commenced to employ artificial respiration on Silvester's plan, his tongue being meanwhile drawn forward by a pair of forceps. No note was taken then of the time that elapsed before a natural respiration was made; and, therefore, no perfectly accurate record can now be given. We are, indeed, little able to calculate the flight of time under such circumstances with precision; and, conscious of the tendency we have under excitement to exaggerate its duration, I did not myself give any estimate; but, on referring to those students who were mere onlookers, I found that none of them gauged the time at less than six minutes before the first feeble respiration showed there was still life in the lad. Little by little the respirations increased in strength, he vomited, and, in a few minutes more, was all right again. It is, of course, easy enough to sling up a slip of a lad in this way, but if we decide to Nélatonise all our patients who show dangerous symptoms, it may chance that some "Manningtree ox" of a man may tax our capacity; would it not, therefore, be desirable to furnish every operating theatre with a hoist by which the weightiest patients might be at once elevated to the necessary altitude, and kept there till the danger has passed away?—*British Medical Journal*, *June* 12, 1875, *p.* 772.

103.—CHLOROFORM OR ETHER?

By R. Brudenell Carter, Esq.

It may be true, as you allege, that the deaths produced by chloroform are only as one to every two thousand five hundred cases in which it is inhaled; but it is inhaled so frequently that this small proportion amounts to a very serious aggregate. I am acquainted with one surgeon, practising in London, who asserts that he has witnessed *sixteen deaths* from chloroform (all of them, I believe, in the course of operations upon the eye); and with another who has witnessed *six deaths*. The mortality, such as it is, is totally without warning. No experience can foresee in what cases it will occur, no skill can do anything to prevent its occurrence. There have, it is true, been a few instances in which life has been threatened by failing respiration, but in these the patient may always be saved if proper treatment is adopted. The deadly cases are those of syncope, or paralysis of the heart, and this, whenever it occurs, appears to place the victim beyond the reach of human aid.

The loss of one life in two thousand five hundred inhalations would not, I think, forbid the use of chloroform in surgery if chloroform were the safest of our anæsthetic agents, or even if it offered any great practical advantages to the administrator or to the operator. But I contend first, that ether is in all respects as available and as effectual as chloroform; secondly, that it is *absolutely safe*. I do not believe that it has ever destroyed life, nor do I believe that it has any tendency to destroy it.

With regard to the efficiency of ether, I may say that I finally abandoned the use of chloroform three years ago. Since that time I have performed at least fifteen hundred operations upon the eye at St. George's Hospital, and a smaller number at the Royal South London Ophthalmic Hospital, using ether as my sole anæsthetic. Its administration requires from two to four minutes, and the anæsthesia which it produces leaves nothing to be desired. It has been in use at St. George's Hospital for a still longer period in general surgery; but until Dr. Joy Jeffries, of Boston (U. S.), taught me in 1872, the proper method of administering it, I did not consider it available for ophthalmic operations. Unless given with great freedom, it does not completely relax the muscular system.

My experience may, I venture to think, be accepted as conclusive with regard to the *efficiency* of ether; and to those who have not found it efficient I would suggest that they have something to learn, as three years ago I myself had all to learn, with regard to the method of administration. On the question of safety let me remind you that, in speaking of our experience of ether as small, you leave out of sight the colossal experience of our brethren in the United States, who, I believe, use ether almost exclusively, and who have had no deaths from its employment. I will not dwell on this part of the subject, because I have written to ask Dr. Joy Jeffries to favour me with an account of the American experience, which, when I receive it, I will transmit to you for publication. My own cases are, of course, insufficient to establish the safety of ether; but they enable me to say that I do not recognise, in the *nature* of its influence, anything which is calculated to be deadly—nor, supposing common care to be taken, do I see in what mode it could produce death. I fully believe in the correctness of Dr. Joy Jeffries' assertion, that, as long as the patient receives air enough to prevent suffocation, you could not destroy life by ether if you tried. No one who has seen much of the use of chloroform can have failed to recognise the oftentimes deadly tendency of its action.

On the grounds which I have thus endeavoured to set forth, I hold that the use of chloroform in surgery can never be necessary, and, as an inevitable consequence, that it can never be justifiable. I make an exception in the case of young children, for whom chloroform is scarcely dangerous, and I do not refer at all to the practice of midwifery, in which the quantity and method of administration are such as to make surgical experience inapplicable. But I hold that no medical practitioner, merely because he has used chloroform without accident until now, or merely because he has not learnt how to use ether, is entitled to expose a patient to the risk of being the one person who will die, although two thousand four hunded and ninety-nine others may escape.—*Lancet*, *Aug.* 7, 1875, *p.* 227.

SYNOPSIS,

(ARRANGED ALPHABETICALLY,) CONTAINING

A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME, SHOWING AT A GLANCE THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE HALF-YEAR.

AFFECTIONS OF THE SYSTEM GENERALLY.

CHOLERA.—*Subcutaneous Injection of Chloral Hydrate.*—I beg to bring forward what I consider to be the right principle on which to treat collapse of cholera. Presuming the morbid state against which we have to contend to be one of asphyxia, caused by spasms of involuntary muscular fibres, due to a condition of hyperactivity of the sympathetic nervous system, the logical inference distinctly points to the exhibition of a remedy calculated to neutralise this condition. Such remedies are to be found in the class of agents which directly depress the activity of the muscular fibres of the circulatory apparatus. It is no good giving medicines by the mouth, as they are generally immediately rejected. I suggest the *hypodermic injection of pure sedatives*, which, if given in sufficient quantities, actually do produce syncope by their palsying action on the heart. In a number of experiments with injection of chloral hydrate hypodermically, in bull-frogs, we found that chloral hydrate caused the death of the frogs, with the heart in the most *complete diastole*, thereby proving that it is one of the most powerful vascular sedatives that we possess. It so happened that I had no opportunity of trying the hypodermic injection of a pure sedative till August, 1873. I then had a soldier in collapse under my care. I dissolved ten grains of chloral hydrate in 100 minims of water, and injected this quantity under the skin of the arms, in four different places. The record of this case will be found in the Indian Medical Gazette for Nov., 1873. Reaction was established in about five hours, and the patient made an excellent recovery, without any inconvenience from the punctures. (Mr. A. R. Hall, p. 34.)

DIPHTHERITIC, SCARLATINAL, AND OTHER FORMS OF SORE THROAT.—*Quinine as a Gargle.*—For the last four months I have treated every suitable case of sore-throat that I have met with in my wards in the Royal Infirmary and elsewhere, with a gargle composed, as a rule, of two grains of sulphate of quinine and five minims of dilute sulphuric acid to each ounce of water. Sometimes I have been able to increase the strength; sometimes I have been compelled to diminish it. When well tolerated, the stronger it is the better. The results I have obtained fully confirm my favourable anticipations. From a considerable number of cases I draw the following conclusions:—1. Simple non-syphilitic ulcers of the throat, under this treatment, at once assume a healthier aspect and heal rapidly. 2. In syphilitic ulcers, the local treatment has always been accompanied by the internal administration of iodide of potassium, or some other suitable constitutional remedy; but my impression is that, in these cases, the cure is hastened by the quinine gargle. 3. Its effect in the sore-throat of scarlatina is very marked, the pultaceous secretion *being checked*, and the inflammatory swelling diminished. 4. It is of com-

paratively little use in the early stage of cynanche tonsillaris, over which tincture of aconite, in minim doses frequently repeated, has so decided a control. When, however, abscess followed by abundant discharge of pus results, its beneficial influence in checking the suppuration and promoting healing is marked. 5. In the slighter forms of diphtheritic sore-throat it answers admirably, preventing the extension of the disease, and promoting the separation of the membraneous exudation. It is, however, in severe cases of true diphtheria that I hope it will prove most useful. I have now employed it in three cases of this disease, and in all the result has been highly satisfactory. (Dr. D. J. Brakenridge, p. 32.)

Excessive Fatigue.—*Effect of Alcohol, Beef Extract, and other Ingesta on the System.*—The experience gained during the Ashantee campaign showed that total abstinence improved the health, and that alcohol, though apparently beneficial when given with food after the day's march was done, was injurious while on the march, the reviving effect passing off after, at the utmost, two and a half miles march had been accomplished, and being succeeded by languor and exhaustion as great or greater than before. When again resorted to its reviving power was less marked; and its narcotizing influence was often traceable in the dulness, unwillingness to march, and loss of cheerfulness of the men. Meat extract, on the contrary, in quantities of not less than half an ounce at a time, was not only powerfully reviving, but sustaining, and so was coffee, though to a considerably less extent. This evidence in favour of meat extracts is of great value at the present time when their power to act either as food or stimulants is so much disputed. The sustaining power of thin gruel, made from boiled oatmeal, during heavy work is well shown in one of the appendices. This agrees perfectly with the observation of Alpine travellers, that small quantities of food at short intervals prevent exhaustion, and with our own experience that, although unaccustomed to exercise, we could carry a knapsack for thirty miles a day without fatigue by simply taking something to eat every two hours. (Dr. E. A. Parkes, Practitioner, Aug. p. 120.)

Gout.—*A New Sign of Gout.*—An elongated uvula is in old people very suggestive of gout. There are few, except gouty persons, who habitually have it at or after middle age. There is a condition of what might be called pharyngitis associated with this, when the whole of the mucous membrane of the pharynx passes into a condition very like that of the elongated uvula, looking clogged, heavy, œdematous, and, as it were, slow to move, and covered with an unusually thick glossy epithelium. The pharynx of a tubercular person differs from this, and is covered with granular prominent glands. (Sir James Paget, p. 170.)

Rheumatism with Neutral or Alkaline Urine.—There are cases of rheumatic fever which, whilst they present all the ordinary features of the disease, have this exceptional one, neutral or alkaline urine. There is the sour perspiration and usual joint affections. These cases are much benefited by the tincture of the muriate of iron—and, indeed, the ordinary alkaline treatment is inadmissible. It is quite possible that this medicine may have a wider range in its application in this disease than I am at present disposed to allow; but I think the fact that we may have acute rheumatism in patients in whom the urine is not acid in its reaction is a point worthy of serious attention, and one which should lead medical practitioners carefully to examine its condition in all cases, and to shape their treatment accordingly. (Dr. J. F. Duncan, p. 45.)

Scarlet-fever.—*Cold Baths.*—In some cases of scarlet-fever cold is as necessary for the relief of hyperpyrexia as in any other febrile disease. There need not be the fear about its use that is generally felt. The rash will not be driven in, but the strength of the patient being conserved, the full development and free course of the rash will rather be favoured. The difficulty is perhaps less in treating scarlet-fever than in dealing with other cases because the patients are usually young and easily lifted in and out of the bath, but when from the weight of the patient or the weakness of the attendants it is impossible to use the bath, the patient may easily be packed in wet sheets, *with or without pieces* of ice placed here and there, or india-rub-

ber bags or large bottles filled with ice may be placed round the patient. The bath gives better results than any other plan when it can be thoroughly carried out, and the most satisfactory way is to begin with the bath at 98° or 100°, and cool down gradually to about 70°. It is of course better that the temperature of the patient and of the water should be frequently taken, but the hand is generally a good enough guide as to the water, and the apearance of the patient always indicates the improvement in his condition. It is worth consideration whether it will not ultimately turn out to be a better plan to keep the patient in the bath for many hours, even for a day or longer if necessary, cooling the water very gradually down, and maintaining it at whatever degree is found to keep the patient's temperature nearest to a healthy point. In the treatment of diseases or injuries of the skin, no evil, but, on the contrary, great good results from much more prolonged baths; and it seems far more reasonable to prolong the period of immersion than to take the patient out and allow the temperature to rise, to be again and again reduced in the same way. (Dr. J. W. Eddison, p. 30.)

The Sulpho-carbolates as Prophylactics against Scarlet-fever and other Zymotic Diseases.—Dr. Sansom fed two guinea-pigs "with pills composed of arrowroot mixed with sodium sulpho-carbolate. No other food was given. In four days the little animals had consumed 275 grains of the salt. No obvious effect was produced, except a slight looseness of the evacuations." The animals were then killed, and it was found that "the flesh showed a marked tendency to resist putrefaction." The administration of sodium sulpho-carbolate is an indirect means of administering carbolic acid; and inasmuch as at least one-fourth of the weight of the sulpho-carbolate employed consists of carbolic acid, we find that an amount equalling from fifteen to ninety grains per diem can be administered of the latter. It is obvious that the direct administration of this amount of carbolic acid would, from its nauseous character and its difficulty of manipulation, be not readily accomplished; and there would be a danger of the toxic action of the latter being manifest—a result which does not occur when the sulpho-carbolates are administered. One would imagine that, in this latter case, there is a gradual evolution of carbolic acid, which at no time is in sufficient amount to manifest its poisonous action. Commencing with moderate doses of the sodium sulpho-carbolate, I soon found that, as stated by Dr. Sansom, from twenty to thirty grains, every two hours, could be easily taken by adults for a considerable length of time, without any inconvenience or physiological disturbance of any kind. *I determined some time ago, whenever I met with the disease in my private practice, to give the sodium sulpho-carbolate to all individuals exposed to the infection who were not protected by a previous attack.* For I argued, if by internal disinfectants we can destroy or inhibit fever-germs after they have multiplied indefinitely, and produced their pathological effects within the body, may we not reasonably hope that, by previously disinfecting the tissues of the body, the germs which first find their way into them will be much more easily destroyed or paralysed? I have administered the sulpho-carbolate of sodium for the above purpose in doses varying, according to age, from five to thirty grains three or four times a day, and sometimes, when well borne, more frequently, to those exposed to the poisons of scarlet-fever, diphtheria, and measles. It was given in seven families to twenty-two individuals exposed to the poison of scarlet-fever; in three families, to fifteen individuals exposed to the poison of diphtheria; and in three families, to eight persons exposed to the poison of measles. The diseases have not in a single instance extended beyond the individuals first affected. (Dr. D. J. Brakenridge, Dr. W. Scott, pp. 22, 25.)

Scarlatinal Dropsy.—In the two late epidemics of scarlatina which have occurred at Perth, the following was found to be the best plan of treating the dropsy which sometimes followed. When the case was one of moderate severity, and uræmic symptoms not a conspicuous feature, sharp purgation with drastics, such as the comp. jalap or comp. scammony powders, answered very well. It was found, however, that a very large dose was required to produce the desired effect, ʒ ss. or even ℈ ii. of comp. jalap being often required for a child five or six years old. This purgation was alternat-

ed by vapour-baths, and at a later period, when a febrile action was diminished, inf. of digitalis with acet. of potash was administered with good results. It will be found, however, that dropsical symptoms in the majority of such cases will persist in spite of all these means, and go on from bad to worse till alarming pulmonary complications show themselves, or convulsions supervene. What now is to be our line of procedure? We venture to affirm, that at this juncture abstraction of blood either general or local—certainly general when there are convulsions—will act in a most beneficial manner, and convert in a short time an apparently hopeless case into a remediable one. In order to accomplish this, however, we must not hesitate to take blood freely, as ten ounces from the arm of a boy ten years of age, or four ounces by cupping over the loins in a child four or five ears of age. Neither must we be deterred from this by the supposed anæmic condition which some writers on renal disorders have ascribed to such patients. The truth is, they are not anæmic at all, but are suffering from an acute disorder associated with a very different condition of the blood from that existing in chronic renal disorders, and the rapidity with which they recover after sharp antiphlogistic treatment sufficiently shows this. Depletion acts like a charm in convulsions from acute uræmia, and we have seen a free diuresis set up in forty-eight hours after its employment, unaided by any other remedies. (Dr. J. P. Bramwell, p. 27.)

Typhoid Fever.—*Effect of Digitalis.*—Digitalis may be very useful in reducing the temperature, but a case is related by Dr. Murrell in which it no doubt assisted in bringing the case to a fatal end. (Practitioner, Nov., p. 351.)

AFFECTIONS OF THE NERVOUS SYSTEM.

Apoplexy.—*What is Serous Apoplexy?*—We occasionally see patients who are insensible and evidently suffering from apoplexy, and yet on examining the brain after death no evidence of hemorrhage can be found. Without intending to suggest that the term serous apoplexy is a correct one, I may fairly assume that cases do occur, in which no cerebral rupture is discovered after death, and no absolute reason appears to be present why the patient should have died. There is interference with circulation through brain substance sufficient to produce coma and paralysis: sometimes such cases do not die, the patient gradually recovers from his coma; hemiplegia remains for a time, but it ultimately yields to rational treatment. In many cases the absolute breakdown takes place after the symptoms have developed, and that cerebral hemorrhage or sanguineous apoplexy is not an antecedent so often as is supposed, but is the consequent of continued impediment to circulation after the coma has appeared. In such cases, whenever doubtful as to whether hemorrhage has taken place, our exertions should be directed to the arrest of the congestive stage which supervenes upon that which causes the first symptoms. These in all cases depend in the first instance upon an anæmic condition of some portion of the cerebral organs, and which anæmia preceded the active development of the attack. This condition of anæmia probably precedes the acute attack in all these cases. In the majority of those which I have met with in which absolute recovery has taken place, I have come to the conclusion that they were due to a condition of blood allied to that which attends the gouty diathesis: that there is a condition of the system which may be fairly styled as that of suppressed gout, and that if the cerebral organs could be examined without injury to life, a condition of capillaries would be found somewhat similar to that which exists in those swellings which suddenly arise in the areolar tissue of persons subject to atonic gout. Common sense appears to tell us that the circulation having to pass through damaged tubes must not be pressed, that it is important not to put extra pressure upon an already damaged hydraulic machine, and that if we increase action in the circulation *by pressing* more matter into it, we shall only be add-

ing fuel to fire. Our efforts should rather be directed first to the removal from the blood of those elements of debased and used-up organic matter which represent used-up tissue, and which from some cause or other have not yet been carted out of the system through the proper excretory organs. These we should get removed as quickly as possible. At the same time we should take off pressure from the vessels themselves, and so lessen the chance of rupture in the now bloated tissue of the brain. (Dr. A. Carpenter, p. 53.)

CARDIALGIA AND TETANUS.—*Nitrite of Amyl.*—Funkel recommends the use of this remedy in cardialgia. After a few inhalations the pain disappears, and if it return, as in a few instances it does, they are to be renewed. The neuralgias accompanying menstruation have also yielded to its influence. One case of tetanus, which had resisted the action of all the means hitherto applied, yielded promptly to the inhalation of two drops three times a day. (Practitioner, Aug. p. 134.)

CHOREA.—*Arsenic.*—Thirty or forty years ago Mr. Hammond, of Whetstone, had great reputation for the cure of chorea by arsenic. In a letter written by him on the subject he said: "The health has need to be well supported. A full diet of meat and two glasses of port wine should be given daily; the latter with water, if the subject be feeble or excitable. An egg should be taken for breakfast, and all trash in diet avoided; that is, all that adds to the labour of digestion without contributing to support. The only purgative ever employed should be rhubarb or the compound decoction of aloes; but only to regulate the bowels, never to purge. The health should be sustained by air and exercise, and diet only modified by the absence or presence of plethora. With menstrual irregularity, riding on horseback will be useful, and air as much as possible, but not to the point of fatigue." Again he says:—"The mineral solution of arsenic is the strongest tonic known; it often subdues ague when quinine has failed. My reputation in the cure of chorea rests wholly on the use of this preparation. I give it in that dose (nine drops three times a day), beginning with four, and gradually, in ten days, getting to nine. I have never known the remedy to fail; at least be assured that few cases of chorea will resist this treatment. If it disagree or headache be felt, lower the dose one drop." These are the *ipsissima verba magistri* never published before. They have lain by neglected for many years, and their resuscitation at the present moment appears to me opportune. The preparation is that adopted into the London Pharmacopœia as the liquor arsenici chloridi. In the British Pharmacopœia, there is a modification of its strength. It is no other than De Valangin's mineral solvent. The directions given are for the treatment of young people; but the difference of the Pharmacopœia must be allowed for. (Mr. G. Gaskoin, p. 52.)

INSOMNIA.—The combination of chloral, morphia, and atropia in certain relative proportions, used subcutaneously or by the mouth, is extremely well adapted to the treatment of insomnia, and is more effective in the relief of pain than either agent alone. This combination is especially suitable in cases of insomnia in the subjects of fatty and dilated heart, and in the irritable heart of the chronic smoker. One drachm of chloral is to be added to four of water, and thirty minims of this contain seven and a half grains. Into this solution is to be put one grain of morphia. Another solution may be thus made: Six drachms of chloral, four grains of sulphate of morphia, and a quarter of a grain of atropiæ sulphas in two ounces of water. (Dr. Bartholow, p. 247.)

NEURALGIA.—The influence of quinine and iron upon neuralgia forms part of the common stock of medical knowledge: but I think it is less widely known that these remedies are far more efficacious in combination than when given singly; that they are far more efficacious in small and frequently-repeated doses than in larger ones separated by longer intervals, even though the same absolute amount may be taken; and that the certainty and celerity of their action may be much increased by the addition of a small quantity of morphia. I am indebted to my friend Mr. Gregory, of Stroud, for the knowledge that a pill containing a grain of quinine, two grains of *potassio-tartrate* of iron, and from a twelfth to a twenty-fourth of a grain of

morphia, according to circumstances, and taken every hour until an expected paroxysm has been missed, will often cure periodic neuralgia with a rapidity and certainty not to be attained by any other method of administering the same medicines. I have also found this formula to be of the greatest possible value in many cases of eye-disease, in which local changes were progressing too rapidly to be overtaken by the use of a grain or two of quinine twice or thrice a day as a "tonic," but in which they were promptly arrested when the patient was brought under the influence of the specified combination. (Mr. R. B. Carter, p. 178.)

Nitrite of Amyl in Facial Neuralgia.—One of the most obvious effects of nitrite of amyl is to cause flushing of the face, and congestion of the parts around the maxillæ. This property renders it a remedy worth trying in cases of facial neuralgia depending upon anæmia. Some cases are related illustrative of this. (Dr. G. H. Evans, p. 48.)

ODONTALGIA.—*Gelseminum.*—Gelseminum is a remedy which has very active properties. Several cases of poisoning by it have occurred. It acts mainly upon the sensory portion of the nervous system. As a remedy in neuralgia the dose of the powder of the root is from one to two grains. I have always used a tincture prepared according to the following formula: Gelsemin root, in coarse powder, two ounces; rectified spirit, twenty fluid ounces. Moisten the powdered root with ten ounces of the spirit, and allow the mixture to stand for twenty-four hours. At the end of that time pack in a percolator, and add the remaining ten ounces of spirit. When the fluid has ceased to flow, remove the contents of the percolator and press them. Add the pressed liquid to that obtained by percolation, filter, and make up with rectified spirit to a pint. Eleven minims of the tincture are equal to about one grain of the root. The tincture contains only a trace of tannin, and may be given with any of the preparations of iron. (Dr. J. Sawyer, p. 49.)

Gelseminum has not been tried half enough by the profession. It sometimes acts beautifully, but its effects are chiefly confined to the nerves of the upper and lower jaw. Dr. Spencer Thompson gives larger doses than usual. He gives 20 minims of the tincture as a first dose, to be repeated any time after an hour and a half if not relieved—a third dose is seldom required. (Dr. S. Thompson, p. 244.)

TOOTHACHE.—I have for a long time very frequently been successful in giving patients relief by stopping the hollow tooth by a paste made in the palm of the hand, by dropping on to a good pinch of the bicarbonate of soda as much tincture of opium or of the vinum opii as the soda will take up, working the whole into a paste, and putting into the tooth. (Dr. W. B. Holderness, Practitioner, May, p. 373.)

OPIUM POISONING.—*Belladonna.*—In a case of poisoning by laudanum one-sixth of a grain of atropine was administered hypodermically and repeated in a quarter of an hour. After the second dose the pupils which were a mere point began to relax, the pulse which was 100 became slower and acquired more volume, and the patient showed signs of returning consciousness. The injections of atropine were continued at intervals, and the patient recovered. Previous to the use of the atropine it was the opinion of those around him that the patient was getting gradually worse, and that the case would prove fatal. (Dr. Heaton, of Leeds, Medical Times and Gazette, April 17, p. 418.)

PARALYSIS OF FACIAL NERVE.—When the facial nerve is paralysed from central disease, it is, according to my experience, always the case that the facial muscles retain, either entirely or in great part, their power of being excited by faradaism. On the other hand, the absence of excitability by faradaism and the exaggerated influence of interrupted voltaism were completely characteristic of facial paralysis *à frigore*. Nearly three months after the seizure, this treatment was commenced, and afterwards continued almost daily for three weeks. Stöhrer's constant current battery was employed, at first four cells being engaged, then six, and finally eight. One rheophore was placed on the cheek at the point where the facial nerve breaks into its two great divisions, and the other at various parts of the face; but especially often near *the ala of the nostril*. The current thus employed caused vigorous

contractions of many muscles affecting the nostril and mouth. At other times one rheophore was applied near the outer canthus, and then the current caused contractions of the orbicularis palpebrarum muscle. Each sitting occupied about twenty minutes. One rheophore was lifted and reapplied at tolerably regular intervals of about 30 or 40 in the minute. This patient became affected on the other side, and I now bethought me of using the finger as a rheophore, and tried it in the following manner. An assistant having applied to the patients' left temple a sponge rheophore connected with one (it was not material which) pole of a Stöhrer's constant current battery, I grasped in my left hand another sponge rheophore coming from the other pole, and then applied the forefinger of my right hand, covered with a single thickness of muslin wetted with pure water, to the right upper eyelid of the patient. The battery was Weiss's (Foveaux's), which had considerably run down, so that it was perhaps only half strength. Cautiously increasing the number of cells (it was long before any electric sensation was felt), I found that the current from between 30 and 40 cells could be employed in this manner, my body, through which it was bound to pass, offering a great resistance, and serving indeed as a rheostat. The application was made through the closed lids. The finger proved an exceedingly convenient rheophore. I could apply exactly the amount of pressure desirable, and could reach portions of the globe which it would have been exceedingly difficult to act upon in any other manner. Moreover the strength of the current could be gauged at every instant. That which was employed was just sufficient to cause me to feel a distinct shock in the knuckle of my right forefinger every time the current was interrupted. Occasional flashes of light were observed by the patient, but he felt no pain. We thought we could see a little improvement in power after the first day's application, but there was no doubt of this at all at the close of the second sitting. Not to weary with a daily record, I may say that this treatment was applied on fifteen occasions in all, the applications extending over a period of three weeks. The time occupied at each sitting was from twenty to thirty minutes. A daily increase in power of the muscles was noted ; and when the patient returned home, after the last application, he was absolutely well. The lid was entirely under control, and the movements of the left eye were in every respect perfect. Of course, therefore, there was no longer any double vision, and the use of the shade was discarded. The patient has since remained quite well. (Dr. T. Buzzard, p. 57.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

Healing of Wounds by Blood Tissue.—Blood effused into an open wound, provided that wound is treated antiseptically, does not perish, but becomes an organised structure and a medium of healing. In a case in which the changes were carefully watched and noted, the clot became distinctly vascular about the twenty-sixth day. On the thirtieth day an epidermic formation was observed on the edges of the clot continuous with the epidermis of the surrounding skin. The practical value of this method of healing wounds by blood-tissue has yet to be tested by further experiments. (Mr. J. Chiene, p. 144.)

Leukhæmia Splenica.—*Phosphorus.*—A man thirty-seven years of age was the subject of leukhæmia splenica. The blood by the microscope appeared to contain nearly twenty times the normal number of white corpuscles. The spleen was so much enlarged as to reach to within two inches of the umbilicus anteriorly and to below the crest of the ilium inferiorly. The fiftieth of a grain of phosphorus, afterwards increased to the thirtieth, was given three times a day, all other treatment beyond nourishing diet being discontinued. The first symptom of improvement was a fall in the rapidity of the *pulse, the next* was a diminution of the pyrexia. In four months the patient *was apparently* cured, the spleen was smaller, but still much enlarged, and

blood contained no excess of white corpuscles, but these were nearly
ble the natural size. As far as is yet known, no case of spontaneous cure
mkhæmia has been reported, or of recovery under indifferent treatment. I
ve, therefore, that in this case, as well as in Dr. Broadbent's, the cure
nclusively attributable to the use of the phosphorus, and he is warmly to
ongratulated on the successful verification of an induction, and on the
overy for a cure for at least some cases of a disease so painful, distress-
, and hopeless as this almost invariably proves to be. It may be found to
more beneficial in the earlier rather than in the later stages of the disease.
at its influence may be when the vast excess of white corpuscles some-
es observed has been attained, can only be verified by further observa-
. (Dr. Broadbent, Dr. Wilson Fox, p. 63.)

LIGATURE OF A MAIN ARTERY FOR ACUTE TRAUMATIC INFLAMMATION.—
. Bryant says: "To arrest acute inflammation in a limb, the deligation of
main artery of the limb, or the arrest of the circulation through it by
ssure upon the artery, has been adopted. Dr. Campbell, of New Orleans,
aks highly of the practice, and even affirms that no portion of an extre-
ty should be amputated for destructive inflammation without the surgeon
empting the practice. Upon the suggestion of Mr. Maunder, of the London
spital, in 1867, Mr. Little applied a ligature to the femoral artery for
te suppuration of the knee, with a success sufficient to prove its value;
d the late Mr. Moore, of Middlesex Hospital, acupressed the brachial arte-
with a good result." Dr. Robert Druitt, in his article on 'Inflammation,'
o says: "Mr. Maunder, of the London Hospital, has tied the femoral ar-
y in several instances of severe inflammation of the lower limb, and has
oken favourably of the results. Mr. Maunder's first case was so treated by
m without any knowledge of the American experiences we have referred
, and his results were as satisfactory as those of Dr. Campbell. The late
r. C. H. Moore also compressed the brachial artery for severe traumatic in-
mmation of the hand, acting on Mr. Maunder's suggestions, and in that
se also the remedy had a very striking effect." (Mr. C. F. Maunder, p. 124.)
1. Ligature of the superficial femoral artery has arrested acute inflamma-
on consequent on a wound of the knee-joint. 2. Ligature of a main artery
ill quickly diminish profuse suppuration, and prevent death by exhaustion.
While it arrests profuse suppuration, it will, by allowing the patient to
ain strength, afford an opportunity for amputation at a future time. 4.
angrene and secondary hemorrhage, as the result of ligature, should not be
nticipated in the healthy subject. 5. The dread of these has arisen from
r knowledge of the consequences of the ligature in instances of known
iseased vessels—aneurism for example. 6. A slough on the heel, caused by
e pressure of a splint, was quickly detached, and the wound soon closed,
though the superficial femoral had been tied a few days previously. 7.
mptoms of inflamed bone ("starting pains") quickly disappeared. (Mr.
. F. Maunder, p. 132.)

Nævus.—A very small nævus may be, as is well known, destroyed by ap-
ying a number of points of vaccine lymph around its circumference. If a
tle larger, the needle of a galvanic cautery, or a needle dipped in nitric
id or perchloride of iron and passed several times through it, may answer
e purpose. These are examples of methods of treatment of the simple form
nævus maternus; but, when it comes to be a case of the other kind, which is
e case that is most frequently dealt with in hospital, such a method of treat-
nt is altogether unsuitable. Subcutaneous nævus or nævoid tumour, to
hich I refer, consists of a dilatation of the vessels of the venous side of the
mour; hence it is often called venous nævus. To understand my observations,
collect that a tumour of the nature of aneurism by anastomosis is found of
ro varieties, according as the venous side of the circulation or the arterial
de is affected. Subcutaneous nævus may, if not very large, be destroyed
r passing through it a few threads, which may be dipped in some acrid
bstance, and are to be left in the part so as to produce inflammation in
eir tracks. Another plan of dealing with nævus is by the application of
ustic substances, especially when it is a combination of the two kinds of the
sease, and when the tumour is of comparatively small size, and is upon the

edge of the lip, the tip of the nose, the brow, or the cheek. The application of strong nitric acid on a piece of wood held against the spot for a considerable time has the effect of producing an eschar or slough. That slough may separate with a certain amount of inflammation; that inflammation coagulates the blood, and gradually obliterates the tumour as before. The third plan is to produce coagulation in the interior by the introduction of the galvanic cautery, or a red-hot iron, if you like—the actual cautery. But the galvanic cautery is best, because it gives you a continually red-hot needle. It produces coagulation in the neigbourhood of the needle; the coagulation extends till the tumour is consolidated and obliteration takes place. Another plan is to introduce, by means of a very fine syringe and hollow needle, a drop or two of perchloride of iron. Perchloride of iron is, of all salts of which we are aware, the one which most rapidly coagulates the blood; hence, when we have hemorrhage from a wound in which we cannot get the blood-vessels tied, we take a small bit of perchloride of iron, or take a piece of lint and dip it in a solution of perchloride of iron, and it will coagulate the blood at once. A few drops of this fluid introduced in subcutaneous nævus will coagulate the blood, and produce consolidation and obliteration as before. Take care, however, that you never employ this form of treatment of nævus in the neighbourhood of a large vein, such as a nævus situated at the lower part of the neck, which is a rare thing, or a nævus near the circumference of the orbit, because a portion of the blood coagulated by the introduction of this fluid may become detached, and may form what is called embolus, or a floating clot, and may get into the circulation of the blood and float away nobody knows where; and may continue floating on until it produces a plug, which may interrupt the circulation in the vessels and produce serious consequences. When the tumour is too large for this treatment, ligature must be tried. Ligature is applicable to nævus when it is circumscribed; when you can, without difficulty, pass a needle under the base of the tumour. The needle is armed with a piece of string, then the string is passed beyond the edge of the tumour, brought underneath its base, and made to emerge beyond its base on the opposite side. The tumour is again transfixed at right angles to the former direction, and a double ligature is brought through underneath the tumour. We have thus two ligatures passing underneath the tumour in one direction, and two passing through in the opposite direction. Next, the ligatures are tied together, and then the whole is constricted and tied together by the free ends. Thus the whole of the base of the tumour is circumscribed, and strangulation takes place by the string passing round the base of the tumour. If the surgeon be not satisfied with the result of the strangulation, he can put another ligature round the base on the outside. If the skin be affected, the tumour is transfixed without any previous operation; but, if it be subcutaneous, and the skin comparatively unaffected, it may be saved by dissecting back four flaps, and the tumour may be transfixed as before. These nævi, when circumscribed, are more or less incapsulated. This capsule consists of the very tissue which permeates throughout the interior. While there is no well-defined capsule in which it lies during the progress of its growth, the tissue gradually becomes so condensed, that it forms itself into a capsule; hence, if you adopt the plan suggested by John Bell, which is the principle that must guide us in dealing with these tumours—namely, never to cut into it, but to cut it out—you can deal with almost any tumour. Apply the knife in such a way as to cut the tissue exterior to the tumour, and by your incision take out the tumour entire. Do not spare it; do not leave a single bit of it; cut on the exterior of it, and lift it out of its capsule.—(Dr. George Buchanan, p. 136.)

[An encapsulated nævus may be turned out of its capsule without any cutting—merely using the handle of the scalpel.—Eds.]

Scarless Eradication of Nævi.—For eradication of nævi upon the arms and face, where it is necessary to avoid a mark, the following is an excellent plan of treatment. Having carefully made out the limits of the nævus both as to depth and circumference, a needle armed with not too fine a wire is *passed through* the skin, half round the tumour, and out again opposite the *place of entrance*; the needle is then again introduced at the same puncture

by which it had just emerged, and, passing round the other side of the tumour, makes its final exit at the opening first made. In certain cases, large size or peculiar shape of the tumour may render it necessary to bring out the needle twice instead of only once. However that may be, the effect is to enclose the base of the tumour in a wire loop, both ends of which, emerging at the same opening, are under perfect control. These might merely be twisted together till the requisite tightness is attained, but in this practice certain inconveniences arise which I have obviated by another expedient. A vulcanite oval plate, about three-quarters of an inch long and an eighth of an inch thick, has two holes bored obliquely through its thickness; and on its external surface two little studs project close to where these holes emerge, and where also they are furthest apart. By bringing the end which passes by the right side of the nævus through the left hole, and *vice versa*, the wire is made to cross, while the oblique direction of the holes permits it to run smoothly. The surgeon, having thus arranged his appliance, draws upon the wires until the nævus is rather tense, and then twists each end round the nearest stud. A piece of lint, slit so as to bestride the wire, is introduced between the skin and the vulcanite button, and prevents any undue pressure by the edges of the plate. On the third or fourth day the wire will have become somewhat loosened: one of the ends is to be untwisted from the stud, drawn tight, and again secured. This process is to be repeated until the wire comes away, when, as must be evident, it has not merely strangulated, but has cut through the base of the nævus with all its vessels of supply; in fact, it has acted like a slow and sure écraseur. (Mr. R. Barwell, p. 142.)

Nævi and Erectile Tumours.—Galvano-puncture.—Galvano-puncture is specially indicated in those cases of nævi and erectile tumours in which the erectile tumour is deep-seated and covered by healthy, undiscoloured skin. Until a few years ago, our interference in such cases was limited to dissecting off and reflecting the superimposed textures, so as to expose the tumour without touching it with the knife, and then strangulating it by strong ligatures, and, when the growth had sloughed and separated, replacing the flaps of the skin; or by ligature of large arterial trunks indirectly connected with the growth, as, for example, ligature of the carotid artery for orbital erectile growths. The former method was attended with grave inconveniences and dangers; and the latter, besides entailing risk, was most uncertain in its effects, as you can readily understand from the nature of the disease. More recently, injections with the perchloride of iron took the place of these methods, and, in a great number of cases, answered very well, but in others a very considerable amount of sloughing took place before the rest of the tumour had been consolidated, and in such cases severe hemorrhage occurred, and the life of the patient was endangered. In some cases also the injections of perchloride were attended with a rapidly fatal issue, apparently from thrombosis. I must, however, say that I never saw such a result, though I have long used, and continue to use, the perchloride of iron injections, and I can only attribute such accidents to the neglect of tearing up the texture of the tumour before injecting the perchloride. (Prof. Spence, p. 143.)

Popliteal Aneurism.—The treatment by compression has a favourable influence on the after-progress of cases generally, by enlarging the collateral circulation, and thus lessening the tendency to gangrene. From this cause it is held that the mortality after the ligature is lessened when it becomes necessary to tie the artery on the failure of compression. On the whole, we may say that, allowing for accidental circumstances, the results of the two methods have been as nearly identical as is possible in a long series of cases extending over many years and a large variety of districts. And this, I must say, is to me a striking argument in favour of the more recent method. The cure by pressure ought to be attempted in all ordinary cases of popliteal aneurism. When the sac is imperfect, or even very weak, it is better, I think, to resort to ligature at once; and if the aneurism is situated towards the knee-joint, or is rapidly growing, I do not advocate long perseverance in the attempt at compression; nor, indeed do I think that in any case pro-

tracted compression is a benefit to the patient, or diminishes the percentage of failure. (Prof. T. Holmes, p. 116.)

The best Method of Compression for the Cure of Popliteal Aneurism.—There can be no question in the first place, that the finger of a trained and intelligent person is a more discriminating, more accurate, and less distressing agent for stopping or checking the circulation than any form of instrument, however ingeniously devised. The femoral artery, as it lies in the groin, side by side with its vein and in close proximity to the bone, can be easily commanded, in a thin or even in a moderately stout person, with little expenditure or force, with an almost total absence of pressure on the vein, and usually without much pain, provided that the person compressing knows how to make the pressure. Now all these points are of great importance, and they together constitute a very great superiority for digital as against instrumental pressure, considered with respect to its facility of application only. The rapidity of the cure in digital pressure is one of its great advantages, closely connected with the less force which it requires and the less pain which it produces. The patient is thus enabled to bear the prolonged application of an efficient amount of pressure, and cure is often produced with astonishing rapidity. Digital pressure should always be made with sufficient force to stop the pulsation of the tumour, and no more. The plan of allowing a perceptible amount of circulation to go on through the tumour, which was a favourite one in my younger days, and was recommended by the Dublin surgeons, is now, I believe, allowed not to have any advantage. It is quite possible that some blood may be really passing through the aneurismal sac, even though no pulsation can be felt; but however this may be, it is certain that the total obliteration of pulse in the aneurism does not retard, but, on the contrary, greatly hastens the cure, and that in some cases the disease has been cured in a very short time. (Prof. T. Holmes, p. 119.)

Primary Disease of the Heart.—The following is a brief summary of the palliative or curative measures to be adopted in the treatment of primary disease of the heart. 1. That it is of the utmost importance in the treatment of primary disease of the heart to reduce to a minimum the calls upon that organ. Consequently light labour alone must be attempted; and rest in bed is often very desirable at the commencement of a course of treatment, as well as at intervals afterwards. 2. Frequently much relief can be afforded when dropsy is present by unloading the distended venous system. Brisk catharsis gives great relief, and does not depress the patient, as might be apprehended. 3. In all cases the heart must be acted upon directly by agents which increase the vigour of the ventricular contractions, of which digitalis is the chief. This agent may be given uninterruptedly for years without any so-called cumulative action, if the cases are properly selected. If given in improper cases unpleasant consequences may follow its administration. (Dr. J. Milner Fothergill, Lancet, May 29, p. 755.)

Varicose Veins of the Leg.—*Excision.*—A man had a varix on the thigh, apparently a part of the internal saphenous vein. It formed an elevation 4½ inches long by 2½ broad, and ¾ inch above the level of the surrounding skin. The following was the treatment adopted: Chloroform having been administered and the blood removed from the limb by the application of Esmarch's elastic bandage and tourniquet, Mr. Davies-Colley made a longitudinal incision 5 inches in length over the varix. He then dissected out the whole of the convoluted mass, which turned out to be a single irregularly dilated vein, more than a foot in length, when extended. A catgut ligature was applied to the vein at the upper and lower parts of the swelling and the whole of the intermediate portion was removed. No sutures were used to draw the edges of the wound together. A spray of carbolic acid diluted with 40 parts of water was employed during the whole of the operation, and the wound was dressed with carbolic gauze dipped in a mixture of 1 part of carbolic acid to 40 of olive oil. The elastic band, which had been used as a tourniquet, was taken off before applying the dressing, and a small amount of venous hemorrhage occurred which was readily controlled by pressure. The practice of ligaturing the veins over pins, and then *subcutaneously* dividing them, is not altogether exempt from danger, and it

is in some respects decidedly inferior to the one above described. There is always considerable uncertainty as to when the pins can be safely removed, and the subcutaneous section of the vein is occasionally inadequate to produce its obliteration, whereas, after excision, the destruction of that part of the vessel is complete, and the patient is spared the inconvenience of having the pins in his skin, and the pain of their removal. (Mr. Davies-Colley, p. 134.)

Wound of the Palmar Arch.—When you cannot reach the cut artery and tie or twist it, it is not enough to bind a graduated compress on the wound, and put the hand and forearm in a sling; nor will you have taken every precaution against the recurrence of the bleeding when, in addition to a well-adjusted compress, you have methodically bandaged the limb from the finger-tips upwards, a proceeding which may seldom be safely omitted; but you should also secure the hand and forearm upon a well-padded splint reaching beyond the fingers and above the elbow, and strictly forbid the slightest attempt on the patient's part to actively move the limb. If he wishes to shift its place he must lift it upon the splint with his other hand. (Mr. J. W. Hulke, p. 133.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

Asthma.—*Spasmodic.*—Dr. K. Anderson has used the subcutaneous injection of morphia in several cases of severe asthma with great success. He says:—The rapidity with which the distressing symptoms are controlled is very striking. In from five to ten minutes after the injection has been administered, the patient finds himself well, *per saltum*. There is no perceptible interval between the agony of breathlessness of one moment and the perfect calm and rest of the next. I have seen a man who had been labouring to speak—jerking out his words syllable by syllable—suddenly rise to his feet, and, with easy and unembarrassed respiration, finish his remarks in an uninterrupted flow. So soon as the morphia gets fairly into the current of the circulation, that moment the spasm is relaxed, and the patient is at peace, with nothing but his exhaustion to testify to the sufferings he has undergone. The dose which I have used has been in all cases one-sixth of a grain of the hydrochlorate of morphia in a strong solution. In no instance has its use been followed by any more unpleasant result than slight nausea. (Dr. K. Anderson, Practitioner, Nov., p. 322.)

Croup.—*Copaiva.*—Dr. Miller has used copaiva extensively in croup for thirty years, and had before spoken of its efficacy. He was in the habit of placing a phial of balsam copaiva in possession of all his patients subject to croup, directing them to take doses of twenty or thirty drops before sending for medical aid. The result was, that whilst he used to be frequently called out at night to attend croup cases, he was now but seldom annoyed at night by similar calls. So great was the faith of his patients in this remedy, that he had often been applied to for his so-called "croup-medicine." It was especially valuable in the early stage. (Dr. Miller, p. 74.)

Hæmoptysis.—Ergot seems to be a good remedy in many of these cases. Dr. Jas. Williamson has treated 50 cases with more or less success. The fifty patients were suffering from phthisis in different stages, and the amount of the hemorrhage varied from abundant bright streaks on the sputa to the expectoration of several ounces of blood. As the cases all occurred in hospital practice, very little time was lost between the advent of the hæmoptysis and the exhibition of the remedy. The ergot was invariably given by the mouth and in the form of the liquid extract. Much has been said about the success of the subcutaneous injection of ergotin and its superiority to this plan, but since there was no difficulty in any of the cases in administering a draught, and as the drug acted in most instances with a promptitude which was sufficiently satisfactory, the hypodermic method was not employed. Forty-minim doses of the liquid extract may be given twice within the first hour, and

guided by the results, at least every two hours afterwards, the dose being diminished and given less frequently as the hemorrhage subsides. I have never observed any disagreeble effect follow even upon the administration of large quantities within short periods, but, as a general rule, if four or five full doses make no distinct impression upon the hemorrhage, the remedy should be abandoned for another. Care should be taken to use a fresh and sound preparation of the ergot. (Dr. J. Williamson, Lancet, Nov. 13, p. 696.)

Winter Cough.—A mode of treatment productive of much benefit in chronic winter cough, is the administration of tar internally combined with the use of ipecacuanha spray. The tar may be given in small capsules each containing two to three grains. Tar water or "eau de goudron" is also made, which contains two grains in the drachm, and may be taken in sugar and water, or with claret at dinner, the combination being almost tasteless. The ipecacuanha wine for use as spray should be diluted with at least an equal quantity of water, and Richardson's double-balled spray-producer may be used for the purpose of atomising it. (Dr. W. Murrell, p. 74.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

Fissure of the Soft Palate.—A slight modification of the operation for closing fissure of the soft palate is the introduction of a silver wire suture through both sides of the cleft velum, but some distance from the edges of the fissure, prior to the use of the knife for freshening its edges. The ends of the wire are brought out of the mouth. When the cutting part of the operation is concluded the wire can be tightened up, and the edges thus approximated at once, and the remaining sutures can be approximated more exactly than they otherwise could. (Mr. E. Bellamy, p. 145.)

Hemorrhoids.—*Injection of Ergot.*—Dr. G. W. Semple reports five cases of piles, two of which were accompanied by prolapsus of the rectum, which he treated successfully by injecting into the rectum after every fæcal discharge half a drachm of the fluid extract of ergot with half an ounce of water. One had a greatly enlarged spleen, which was reduced to its normal size by the treatment. A third was that of a pregnant woman who suffered no inconvenience from the treatment. (St. Louis Med. Journal—Practitioner, Aug., p. 142.)

Hernia.—*Inversion.*—The treatment of hernia by inversion consists in placing the patient in such a position as to bring the force of gravity into play to reduce the rupture. This may easily be effected by raising the foot of the patient's bed, and keeping it supported at an angle of 45°. In this posture the intestines naturally gravitate towards the upper part of the abdominal cavity, and gradually draw in the ruptured portion. It is evident, from the nature of the case, that a force acting gradually and equally from within the abdomen must be far safer and more effectual than any pressure applied externally. The use of the taxis, however carefully applied, must almost always involve some bruising of the parts, which would have an injurious effect should the attempts at reduction be unsuccessful and an operation become necessary. (Surgeon-Major Thornton, p. 146.)

Radical Cure of Hernia.—The only instruments used are a double spear-pointed semi-circular needle, with an eye in each point, silver wire, a piece of cork, soft wood, or roll of adhesive plaster. The parts being well shaven, three lines are drawn with a brush and tincture of iodine, parallel to the direction of the hernial orifice, the centre line being immediately over the internal orifice and passing down to the external orifice, if the hernia be oblique ingunial; in other varieties, immediately over the greatest enlargement of the tumour. The needle is then taken hold of by the left hand at its unthreaded end; then the right hand, with the thumb and forefinger, pulls *up the skin and superficial fascia as high as it can be done to the right of the middle line, letting* the middle line be just below the point of the thumb.

The threaded end is then pushed through the fold held below the point of the thumb and index finger. The fold is then let loose, and the threaded end taken by its point with the thumb and fingers of the right hand; it is then pulled on until the unthreaded end comes just under the outside line of right side of the operator, and left side of patient. The index finger of the left hand is made to invaginate the integuments as far as possible, and the finger is pushed to the right under the left tendon of patient, feeling well the wall. The right hand then raises the needle, so as to have its point directly over the point of the finger and a little to the outside of it. The needle is then pushed directly down through the tendon into the peritoneal cavity; at this stage, the point of the index finger of the left hand is carried to the right side of the patient, and held under the tendons; the needle is then moved about to see if it be loose, and turned in its curve so as to carry the curved portion of its point under the invaginated integuments, &c., to about one-quarter of an inch of the right tendon; the end is then brought out on the outside line of the patient's right side; this is done by pressing down on the threaded end held by the surgeon's right hand. The index finger of the left hand is then taken out, and the threaded end let go, and the unthreaded end is taken hold of by the right thumb and index finger of the right hand. It is now gently pulled on until the threaded end comes above the tendon. The point threaded is then reversed, and keeping well down on the tendon, is finally pushed out at the first puncture and pulled entirely out, leaving the two ends of the ligature close together in the same puncture. We have thus put a ligature entirely around the two sides of the rupture, with a sufficient portion of the tendon and muscles to give the thread sufficient surface to act on; and now, by pulling on the two ends, the rupture is closed internally by the replacing of its natural support, and then the ends are tied around a piece of cork or soft wood. If one ligature do not close the opening so that the point of the finger cannot be pushed under the wire, another wire is put in in the same way. Before tying the first, enough must be put in to completely close the rupture, and they should not be more than a quarter or half an inch apart. The operation can be performed on either side; but it is best in inguinal hernia to start the needle from the side opposite to the ilio-pubic ligament. This enables the needle to be pushed down by the side of the ligament. This method is simple and easy to perform, and is applicable to all external herniæ. The process is the same, and made with the same needle and silver wire. Of course, it is not applicable to internal hernia, as diaphragmatic, obturatic, ischiatic, entrocystic, invaginal, vaginal and rectal, as they cannot be reached without resorting to the direct method, which ought to be done in all cases of strangulated hernia, when this needle will much facilitate a closure of the incision. The wires are to be left in from four to seven days, according to the inflammation of the parts. Lotion of sugar of lead and morphine are to be applied externally, according to circumstances.—(Dr. G. Dowell, of Galveston, London Med. Record, April 21, p. 244.)

PRURITUS ANI.—*Marine Lint.*—Two years ago I suggested the use of marine lint for the relief of pruritis ani. I have often been written to, inquiring what this lint was, and to-day I have a letter asking about it. As it does not appear to be generally known, I beg to state that it is finely carded tow soaked with tar, kept in tin cases. It is made by Maw and Son, of London. (Dr. James Thompson, Lancet, May 29, p. 779.)

TAPEWORM.—*Creasote.*—Creasote possesses properties most unfavourable to the vitality of the lower grades of animal life. It may be used as a vermifuge with advantage. In the case of a tubercular man suffering also with tapeworm, I gave him one drop of creasote made into a pill with pulv. tragacanthæ co. three times a day, half an hour after each meal, so as to impregnate the ingesta. As the stomach bore the medicine well for two days I increased the dose to two drops three times a day for two more days, and then to three drops at a time for two more days. On the seventh day I gave him a dose of castor-oil (aperients acted very strongly on this patient, or I should have combined it with sp. terebinthinæ). On the fifth day of the treatment a worm eight yards long came away, and he had slight diarrhœa. Not seeing me, he continued *the creasote on* the sixth day, and took the oil on the sev-

enth, which acted very freely, but brought no more worm away. (Mr. H. Brickwell, p. 77.)

Vomiting.—Perhaps the most severe cases of vomiting, and certainly the most distressing, are caused by over-stimulation during pregnancy. Apart, however, from pregnancy, there are two well-defined conditions of alcoholism in which vomiting is a prominent symptom. In one the vomiting is the result of an oft-repeated debauch, of the previous night perhaps, in which case we may trust to the offender's sensations of wretchedness, backed by the more material agency of the vomiting, to work a cure, for the present at least; in the other the vomiting is due to altered gastric secretion and to degenerative changes resulting from chronic inflammation of the coats of the stomach; a condition which is more or less remediable, until, through long continuance, thickening takes place locally, the vital organs become congested, and the digestion and other functions of life are permanently impaired. (Dr. P. H. Stokoe, p. 78.)

AFFECTIONS OF THE URINARY SYSTEM.

The Catheter.—In a case of paralysis when the bladder has lost its power of expulsion, is there any method by which, in catheterizing the male bladder, the pressure of the column of urine in the instrument could be done away with? There is. By using a very long flexible catheter, and bending down the outer half of it, so as to make the urine leave the instrument at as low a level as it enters it within the bladder, we balance the column which is obstructing the evacuation with one which facilitates it, and the only thing required of the bladder in this case is to overcome the friction of the urine against the interior of the tube. By bending down the end of the catheter still further, we convert it into a syphon, the long leg of which is external, and, the descending column of urine more than balancing the ascending one, the urine, having once begun to flow, is bound to go on running, until the bladder is entirely empty. The urine no longer requires to be pressed out, it is drawn out. But flexible catheters are not passed with the same readiness as silver ones, and they are in many respects inconvenient. It would be desirable to have the ordinary metallic catheter used as the short leg of the syphon. This I have succeeded in arranging, by the very simple method of putting on a flexible tube to the extremity of a silver catheter, ending with a curve, instead of the straight abrupt extremity that the catheters at present in use have. I have had a catheter of this sort constructed for me by Mr. Gardner, of Edinburgh, and, after seeing it, I am much surprised that instruments of this form have not come into ordinary use long ere this. Apart altogether from its capability of forming part of a syphon, when used alone without the flexible tube, the urine flows from it into the receiving vessel so much more conveniently than from catheters of the ordinary shape, that I should now be sorry to return to the latter, which almost invariably soil the bedclothes of the patient and the hands of the surgeon. All that is necessary to convert this form of catheter into a syphon, is to slip on to it the end of an india-rubber tube. Such a tube as is attached to a ball pessary answers well. The tube must be considerably longer than the catheter, in order that it may form the long leg, and the catheter the short leg, of the syphon. When, therefore, the catheter with the tube thus attached to it is introduced into the bladder distended with urine, and the external end of the catheter is bent down towards the patient's bed, the first gush of urine fills both catheter and india-rubber tube, and flows out at the extremity of the latter. We may now allow the catheter to assume the position that the elasticity of the patient's tissues, uninterfered with, assigns to it. The external end of the catheter will spring up, yet the urine will continue to flow; for the syphon having once commenced to act, the emptying of the bladder *will go on until* the whole of what it contains is drawn off. Since the

longer the descending column of fluid is, the more satisfactorily does the syphon work, I have found it of advantage to carry the tube below the thigh of the patient, and allow the urine to run into a vessel standing at the side of, and at a lower level than, the bed. (Dr. R. Somerville, p. 166.)

DIABETES.—*Diabetes Insipidus.—Jaborandi.*—In a case of diabetes insipidus, the patient complaining of great thirst, and the skin being dry, jaborandi was ordered in the form of infusion of the strength of one drachm of the leaves and twigs to six ounces of water; of this a dessertspoonful was taken every four hours. On Feb. 28th a tablespoonful of the infusion was given every three hours; on March 1st a tablespoon every two hours; March 4th, two tablespoonfuls every hour. On March 5th the skin of the back, abdomen, and inner aspect of the thighs was found to be perspiring pretty freely. On the 6th (the jaborandi being continued as when last mentioned) the skin of the arms and of the left palm perspired. 15th: The quantity of urine has declined steadily from 300 oz. on Feb. 26th to 236 oz. on March 14th. 31st: The treatment with the jaborandi having been continued, the quantity of urine passed to-day was 180 oz. The patient has found his mouth uneasy several times, and the amount of the infusion to be taken (varying from one to two tablespoonfuls every hour) is left to his own sense of comfort or discomfort. His skin is moist, and he declares himself much easier and better in all respects, but still has "some of the old burning feeling in the throat and gullet." April 2nd: The sense of discomfort in the mouth amounts to-day to pain in the teeth and some slight difficulty in opening the mouth. He is ordered to take the jaborandi less frequently. The quantity of urine continued to diminish steadily till the middle of May, when it amounted to 120 oz. per diem. (Dr. T. Laycock, p. 80.)

Diabetes Mellitus.—A case was considerably benefited, in addition to ordinary treatment, by breathing nothing but warm air. Use a respirator and a knitted woollen cloth over both respirator and nostrils, and always keep the mouth closed as much as possible. (Dr. Charteris, Lancet, Nov. 6, p. 658.)

Dr. Donkin holds that experience has fully demonstrated that against the disease itself our only resource is *dietetic* treatment; that by this means alone we can expect either to arrest its progress entirely, or mitigate its severity. He does not wish it to be inferred that medicinal treatment is useless, or unnecessary, for the various complications which may arise during the progress of the disease. In considering the dietetic treatment of diabetes, he excludes all simple cases of glycosuria, whether permanent or intermittent, from deficient assimilation of starch and sugar occurring in subjects at an advanced period of life, and laments that the plan of treatment he advocates is too often brought into disrepute by the careless, slovenly, and imperfect manner in which it is applied. His rules for employing the skim-milk treatment are that the skim-milk *regimen must be exclusive;* that the quantity of skim-milk—*properly prepared by the careful removal of the cream*—beginning with four, five, or six pints on the first day, must be increased more or less gradually, according to circumstances; to eight, nine, ten, eleven, or twelve pints in the twenty-four hours, according to the age, sex, size, and condition of the patient. No rule as to quantity can be laid down to suit individual cases; it must be regulated to suit the requirements of each, *but in no instance should it exceed twelve pints.* Not more than seven or eight pints should be taken in the natural fluid condition. When a larger quantity is necessary, the surplus should be made into curd by the essence of renet, and taken at separate meals. The skim-milk may be taken cold, or warmed to a temperature of 100° or so, but it must not be boiled, because a temperature of 212° alters the physical properties of casein, and greatly impairs its therapeutic properties. The specific gravity of the skim-milk used should never be below 1035; that of the best quality is 1040. The daily allowance must be divided into regular meals. The constipation which this diet generally produces must be carefully remedied by the frequent administration of castor-oil, or of some mild saline aperient. The author does not parade this method of treatment as a panacea; his experience of it has led him to the conclusion that if there is no progressive reduction of the specific gravity of the urine and of *the sugar it contains* after the expiration of a week (all rules

having been strictly observed), little or no good will be produced by the treatment, which may then be discontinued. (Dr. A. S. Donkin, Dublin Journal of Medical Science, Nov., p. 421.)

STRICTURE OF THE URETHRA—*External and Internal Division.*—Prof. Otis, having a case of stricture complicated with fistulous openings to treat, first incised the perineum, and opened the urethra externally to a slight extent, and then introduced a urethrotome, and freely divided all strictured portions of the canal. Taking a lesson from this case of Prof. Otis, I operated on my case in the following way: Having passed a No. 2 silver catheter through the strictures into the bladder, I made a free incision in the middle line of the perineum, through the thickened tissues, and opened into the urethra immediately behind the point of the posterior stricture. I made no attempt to divide the stricture by this external incision, but, having removed the catheter, I introduced along the urethra into the bladder the fine grooved staff of a urethrotome (one after Maisonneuve's principle), and then, by passing the knife of this instrument along the whole length of its groove, the entire strictured portions of the canal were thoroughly divided. The whole operation did not occupy more than a few minutes, and I was much impressed with the advantages as regards easy and quick performance over the method of external division as usually followed. A No. 12 catheter was readily passed into the bladder after the operation, and was retained there for twenty-four hours. The patient's progress after the operation was in every way satisfactory. (Mr. T. Annandale, p. 156.)

Dr. Otis' Method of Treating Stricture of the Urethra by Division.—The method of Dr. Otis is based on the simple proposition "that in all contractions of the urethra the contractile points must be reduced to the normal calibre of the urethra in its healthy state." This applies to all deviations, and, in Dr. Otis' view, especially to "comparatively slight contractions." The surgeon must begin by ascertaining the normal calibre of the individual urethra. This ascertained, we have various methods of "sundering" the stricture at some point. The selection must rest on the judgment of the operator; but whatever method may be selected—whether rupture, dilatation, or division—*every* fibre of the constricting tissue must be completely severed, or subsequent recontraction is certain. To ensure the attainment of these objects, Dr. Otis has devised a new form of urethrotome, which combines dilatation with division, though the object of dilatation is chiefly to enable us to apply the edge of the blade more surely to the strictures which we intend to divide, and thus to protect, or nearly so, the healthy portions of the canal. All the bands which obstruct the canal must be divided one after another, if not detected at first. Dr. Otis never practises dilatation after the healing of the wound made during the operation. The incision is along the superior wall of the canal, against which the dilating portion of the instrument forcibly presses the blade. The use of the sound after the operation is simply to separate the divided surfaces, not to dilate. The after-treatment consists merely in separating the wound throughout its extent by the easy passage of a full-sized steel sound daily, or every other day, until healing is complete. If recontraction occurs after the operation, it is simply owing to incomplete division. (Mr. W. Coulson, p. 159.)

Impassable Stricture.—By this is meant a stricture where no instrument can be passed with any ordinary efforts, yet in which the patient may be able to pass water in a materially diminished stream, or guttatim. In the first instance I take bearings, passing down as far as I can, but in the gentlest maner, a large-sized instrument, and on its passage being arrested, I learn the site of the stricture—an important item of information, and one that generally will enable the experienced surgeon to predicate with tolerable accuracy whether he will have more than one stricture to cope with. Having learned so much, I now take a much smaller instrument, and upon failing to pass it, I have recourse to the smallest size in my armamentarium, and if, after repeated but most gentle efforts, I fail in introducing it, I desist for that day, *making* my patient take for fifteen or twenty minutes a warm bath, and order*ing for him* an anodyne draught to be taken on going to bed. Here I would

wish to pause for one moment to dwell upon the importance of extreme gentleness in the management of such cases. Nothing is to be gained by force. The instrument should, as it were, be coaxed, not driven, through the stricture. When dwelling on the importance of gentleness in our efforts to pass an instrument, Civiale says that it should be "swallowed" by the urethra, in using which expression he unwittingly foreshadowed that which I have since demonstrated—that the vermicular action of the urethra is towards, not from, the bladder. Should the slightest appearance of blood present itself I invariably desist for that day from my efforts to pass an instrument. Next day, if circumstances permit of it, I see my patient in bed, and I proceed as follows: I pass down to the stricture a fine catgut bougie, and when its course is arrested I commence to rotate it, always in that direction which will not unravel the gut, and after doing so some five or six times, I pull gently, very gently, on the catgut, and if it has wormed its way, be it ever so short a distance, into the stricture, it will give a sensation to the operator's hand of being gripped—held fast—by the stricture, a sensation which, when once experienced by the surgeon, can never afterwards be mistaken. Having felt this, I recommence the rotation of the catgut, and if the stricture be a short one, I worm its way on into the bladder, where I leave it for a few hours, and then withdraw it, again ordering my patient, as before, the warm bath and anodyne draught. The surgeon who employs this plan of treatment for the first time, on proceeding to withdraw the catgut, will be surprised at the amount of force he will have to use to overcome the tenacity of the grip with which the stricture holds the catgut, the latter having swollen considerably whilst lying in the moist warm urethra. After a few days of such treatment I experience no difficulty in introducing a small-sized catheter into the bladder, which I frequently leave in for a night, and thus the urethra will be sufficiently enlarged to admit of any form of instrument the surgeon may wish to employ for the purpose of completing the treatment on the "immediate plan." (Dr. R. Macnamara, p. 163.)

Impermeable Stricture.—Whenever I find that previous abortive efforts have been made to pass an instrument, I never commence the treatment by trying to pass an instrument, but proceed as follows: I administer to the patient at once in a tablespoonful of water fifteen minims of a mixture composed of one part of the liquor morphiæ hydrochloratis (B. P.) and two parts of the tinctura ferri perchloridi (B. P.), and this I repeat every ten minutes until I succeed in my further efforts. As soon as I can I have him placed in a warm bath, the temperature of which, at first 98° of Fahrenheit's thermometer, is raised to 100°; and when he has been in this bath about fifteen minutes or so, by which time he will probably have taken his third or fourth dose of the mixture, I in the gentlest manner possible steal into his bladder a soft No. 2 (Weiss's gauge) gum elastic catheter, and once it has reached the bladder I take good care to leave it there until the following day. I know that, as a Professor of Materia Medica, I should be ashamed of the combination I have just suggested; but from repeated experience I also know its practical value. Proceeding after this fashion, I have never yet failed to relieve my patient, and it is a remarkable fact for a surgeon to a large metropolitan hospital to have to state, but nevertheless still a fact, that I have never yet seen the blader tapped but on one occasion, and then I myself performed the operation. (Dr. R. Macnamara, p. 162.)

URETHROTOMY.—*New Urethrotome.*—For this operation an improved instrument has been made for Dr. Watson by Mr. Young, of Edinburgh. It consists essentially of a Syme's stricture staff, from which a tenotomy blade is made to protrude at an angle on turning from left to right a wheel fixed at the proximal extremity of the instrument. This instrument is probe-pointed at the distal extremity, and the size of a No. 10 or 12 at the haft. The instrument gradually increases for four inches from the fine probe-pointed extremity, up to the size of a No. 2 bougie. Here it abruptly enlarges to the size of a No. 12. At this point, where the thick and thin portions of the instrument are continuous, a tenotomy knife-blade, concealed in a groove in the slender part of the shaft, is so pivoted that it can be projected at an angle with the *commencement of the* thick portion of the staff. The degree of

angular projection of the knife is determined by the number of turns given to the screw attached to the handle of the instrument, and this degree of protrusion is marked by an indicator on the shaft. For the purpose of cleansing the instrument after use, the blade can be screwed out to a right angle to the shaft; but in use, when dividing a stricture, no protrusion beyond an angle of 45° is required. The instrument in all its parts, except the blade, is nickelised to prevent rusting. When employed the instrument is introduced with the blade enclosed in its groove. When the pointed extremity has been insinuated through the strictured part of the canal, it glides smoothly onwards towards the bladder, till the anterior extremity of the stricture arrests the progress of the thick portion of the staff. The anterior extremity of the stricture is thus determined with absolute precision, and as few strictures exceed an inch and a half in length, the blade is sufficiently long to secure the division of the stricture with one movement of withdrawal of the whole instrument. When once the instrument has been lodged in close contact with the stricture, the screw in the handle is turned so as to secure a protrusion of the blade to an angle of 30°, the whole instrument is then drawn forward as if to withdraw it from the canal. When this is at first attempted it is felt to be firmly held, then the tissues yield. When the instrument has been withdrawn about two inches from the urethra, the screw is inverted, causing the blade to retreat completely into its groove, and the passage of the whole instrument onwards towards the bladder is once more attempted. In most instances this is found unopposed. And if it be so, the urethrotome is withdrawn, and a full-sized catheter passed to empty the bladder. Should the passage onwards of the thick portion of the instrument be opposed, either another stricture or some portion of the same stricture is shown to be undivided. A reprotrusion of the blade, and repetition of the movement of withdrawal, will secure the division of this obstruction, and similarly of any other constriction which may still oppose the passage of the full-sized portion of the stem of the instrument. (Dr. P. H. Watson, p. 154.)

Varicocele.—*Operation by Subcutaneous Wire-loop.*—First, it is most important that the vas deferens and spermatic artery be separated from the veins. This is best done by the surgeon standing on the patient's left (supposing the disease to be on that side), and taking that half of the scrotum, about an inch above the testicle, between the left finger and thumb, and feeling for the duct by rubbing the two surfaces of the bag gently together while its walls glide from his grip. When he has thus brought the duct and artery from among the venus plexus and holds them between his thumb and finger-tip, he must let them slip away to the back, so that he will enclose the veins within the circle of his finger and thumb and exclude from it the artery and the vas deferens. The digit tips and slightly compressed scrotum will separate the one set of vessels from the other. If, in seeking for the duct, the surgeon have allowed a few veins to slip away with it, he can begin again, with the advantage of having no longer the whole mass, but only a few vessels, to deal with. If he be not sure of having successfully isolated this important part, he must examine the condition of things with his right hand while keeping the left in the same position. Supposing this separation accomplished, the bit of scrotum between the finger tips is to be squeezed rather tight, and a needle, armed with iron or silver wire, not too fine, thrust straight through above them. Now the part may be released from grasp, and the needle passed in again at the puncture of exit, in front of the veins, and out at the first place of entrance. Thus at one opening protrude the two ends of the wire, and at the other a loop; by drawing on the ends the loop is pulled into the scrotal cavity, and closely surrounds the varicocele. Each end is passed through a hole in the little instrument I depicted in my former paper, and drawn tight enough to make the veins below swell, bulge, and partly consolidate. Every other day, or every day if time be an object, the wire may be tightened until it has cut through all the consolidated veins, and has come away. No suppuration nor apparent inflammation accompanies the process. The patient need not be confined to his bed *after the first* forty-eight hours. One caution must be given. In passing

ıe needle the second time—*i.e.*, in front of the veins—its course must be ntirely in the cavity of the scrotum. If, from over-anxiety to include every cin, or from other cause, some of the lining fascia be strangulated in the oop, the case will be considerably retarded, and some amount of suppuration, companied by swelling in the walls of the sac, is likely to ensue. The opetion, well performed, is very slightly painful. (Mr. R. Barwell, p. 152.)

MPUTATIONS, FRACTURES, AND AFFECTIONS OF THE BONES AND JOINTS.

ANCHYLOSIS OF THE ELBOW-JOINT FROM INJURY.—There is a method of cision of the condyloid head of the humerus for the cure of anchylosis of e elbow-joint which is worth consideration. It was proposed by Dr. P. H. atson, of Edinburgh. It consists essentially in resecting and removing the ndyloid end of the humerus without cutting the attachment of the triceps the olecranon, or that of the brachialis anticus to the coronoid process—in ct, without removing any part of the articular surfaces of the ulna or ra-ıs. By this method the natural movements of the elbow are preserved, and e tendency to recurrence of the anchylosis is prevented. (Prof. Spence, edical Times and Gazette, Aug. 21, p. 207.)

ANTISEPTIC SURGERY.—Paradoxical as it may at first appear, with antiptic treatment the more free the wound, and the more widely it gapes, the ore certain you are to avoid inflammatory disturbance in the joint; simply r this reason, that you are the more certain of a free discharge of the sma effused into the interior. The antiseptic will not be introduced o the joint; it will not be applied to the affected part at all. It will be rely employed externally to prevent the access of septic mischief while we ovide exit for fluid from the interior. We shall first purify the skin with trong (1 to 20) watery solution of carbolic acid, which is best for deterıt purposes; water holding carbolic acid but slightly, and very readily ring it up to act upon anything else. Carbolic acid has a remarkable netrating property. It blends with oily substances and animal matters, and netrates the hair and hair-follicles, and therefore such a washing as I am w giving will render the skin absolutely pure, surgically speaking. This a very great point. In the next place, we shall have an antiseptic atmosere provided by means of this spray-producer, which acts on the princi-e of Siegle's steam inhaler. High-pressure steam, issuing by a minute ori-e from a boiler heated by spirit-lamp or gas, sucks up a strong solution of rbolic acid by a tube that dips into a vessel containing it, and, blending th it in about equal quantity, forms a 1 to 40 spray. [Mr. Lister then oceeded to perform the operation. Some small arteries, which bled in the ision, were secured with fine prepared catgut, and the joint having been ened, two drainage tubes, each about ¼ inch in diameter, were inserted le by side; an obstructing band within the articulation being divided by robe-pointed knife guided by the finger so as to permit them to be introced fairly into the cavity. He commented on the various steps as he proded, urging again the absolute necessity of having all the instruments roughly aseptic.] The operation having now been performed, the next int is so to dress the wound as to make sure that nothing septic will get in fore next dressing; this must be not a matter of hope but of certainty. e material which we have used for some time past is an open cotton cloth, th the fibres impregnated with a mixture of carbolic acid and common in. Common resin holds carbolic acid with extreme tenacity, and in conquence of this gives it off so slowly as to be unirritating to the skin; yet the temperature of the human body it furnishes a sufficient supply of the d for a trustworthy antiseptic dressing. But at the ordinary tempera-e of the air in this country, the antiseptic is evolved so slowly from the ıze *that the fermentative energy* of septic dust is not at once extinguished

by falling upon it, as it is by mingling with a strong watery solution; and if the gauze were applied dry, some active septic particle, adhering to its surface, might enter the blood or serum at the outlet of the wound, and propagate putrefaction to the interior. A small piece of gauze dipped in the lotion having been placed next the wound, the dressing on which we rely for excluding putrefaction is applied in the form of eight layers of the gauze, sufficiently broad, as you see, to cover the surrounding skin for several inches in every direction; and beneath the outermost layer is placed this piece of thin Mackintosh cloth to prevent the discharge from going directly through the dressing; because, if a considerable quantity went through, strongly as the resin holds carbolic acid, it might be all washed out before twenty-four hours had elapsed, and then putrefaction would spread inwards to the wound. The dressing is secured by a bandage, for which strips of the antiseptic gauze prove very convenient. (Prof. Lister, p. 91.)

Boracic Acid in Antiseptic Surgery.—The use of boracic acid as an antiseptic was first brought under notice by the sale of a powder and liquid in Sweden for the preservation of articles of food, and as an application to wounds. The active principle was discovered to be boracic acid. Boracic acid was then little more than a chemical curiosity. But I succeeded in obtaining in Edinburgh a sufficient quantity to enable me to test its properties unmixed with other ingredients. A striking instance of its antiseptic efficacy as well as of its therapeutic value was at once presented by a case of pruritis ani of upwards of ten years' standing. The affected part was washed with a saturated watery solution at bedtime, and a small piece of lint soaked with the same lotion was applied and retained during the night. The result was immediate relief from the accustomed irritation, and, what struck me as extremely remarkable, the bit of lint when removed next morning, was free from smell. It was afterwards found that even the slight mechanical irritation caused by the presence of the lint might be avoided; for the mere application of a few drops of the watery solution last thing at night, the part being left moist with the liquid, proved completely efficacious; and this simple treatment being continued for a while, the obstinate tendency to irritation gradually disappeared, while the thickening of the folds of skin, which had been of several years' duration, entirely subsided. Another example of the usefulness of the new remedy was furnished about the same time by a case of inveterate eczema of the ankles in a lady above the middle period of life. The water dressing which she used being removed, a very unusually fetid odour was exhaled from the moist scarlet surface which, tender as it was, she was impelled to scratch by an intolerable sense of itching. Thinking that here, as in the case of pruritis, the irritation caused by putrefaction might be a main element in the obstinancy and discomfort of the complaint, I gave the boracic acid a trial, substituting a saturated watery solution for the water in the dressing previously employed. The effect was at once to correct the fetor, but in this case the application occasioned a good deal of persistent uneasiness in the sensitive surface. The patient, however, persevered with the treatment, and in a short time the ankles were both in a sound condition, which I was lately glad to learn had proved permanent. In order to be of use in antiseptic surgery lint soaked in a watery solution would not do. The antiseptic must be stored up in the lint if its power is to be anything but very temporary. This may be managed by soaking lint in a hot saturated solution of the acid and allowing it to dry, when it will be found to weigh about double its former weight, and to be full of the soft unctuous crystals of the acid. The boracic lint has proved very valuable in the treatment of ulcers of the legs or elsewhere. In dealing with them, the first step is to cleanse the sore and the surrounding skin once for all from septic impurity. This is done by treating the surface of the sore freely with a solution of chloride of zinc (forty grains to the ounce), and at the same time washing the integument with a strong watery solution of carbolic acid, which is used on account of its remarkable power of penetrating the epidermis, while for the sore itself the solution of the chloride appears to be more efficient. This preliminary step having been taken, the boracic dressing is at once employed as follows:—A piece of oil-silk protective, of suf-

t size to cover the sore and slightly overlap the surrounding skin, is d in the boracic lotion (a saturated watery [solution) and applied, and this a piece of boracic lint large enough to extend for an inch or more nd the protective on all sides, the whole being retained in position with dage. It is well to soak the boracic lint with the lotion before putting not for the sake of adding more of the acid, but because the lint, when ed moist and allowed to dry on, is less liable to slip afterwards from its on, and also for the purpose of purifying the surface of the lint itself i in the dry state has no power of acting upon septic dust adhering to e acid which it contains being non-volatile, and, therefore, only acting in solution. (Prof. J. Lister, p. 84.)

racic Acid Ointment.—Boracic acid may be sometimes used with ad- ge in the form of an ointment, for which I would advise the following of preparation :—Take of boracic acid, finely levigated, one part; wax, one part; paraffin, two parts ; almond oil, two parts. Melt the nd paraffin by heating them with the oil, and stir the mixture briskly with the boracic acid powder in a warm mortar till the mass thickens. set it aside to cool, after which it will be found to be a pretty firm mass, which is to be reduced to the proper consistence of a uniform ent by rubbing down successive portions of about an ounce each in a mortar. This ointment, when used, is spread very thin upon fine muslin en rag, which absorbs more or less of the almond oil and leaves a layer nded wax and paraffin, flexible at the temperature of the body, and sep- e from the skin with the utmost ease by the discharge, which is thus not confined by it, but diffuses itself and flows out beneath it, receiving as es an abundant supply of the acid to prevent putrefaction, whilst cica- ion is not materially interfered with by the mild antiseptic, and still y the perfectly bland wax and paraffin. (Prof. Lister, p. 89.)

OODLESS SURGERY.—In many cases of amputation, owing to the septic of the tissues or the malignant nature of the disease for which we are ting, I consider it inadvisable to repress the blood and other fluids— as unhealthy pus or cancer juices—into the parts above. In such cases, aw a band of indiarubber tubing, pressing on the limb from above wards, and tighten it immediately above the part to be removed. This, of e, saves no blood to the patient; but it renders the operation bloodless other sense, and is especially useful in private practice, as avoiding ng of the floor or furniture. In cases of excisions of joints, where the are loaded with pus, I constrict above and below the point to be ope- on, and thus secure a nearly bloodless operation without risk of re- ing the unhealthy fluids into the textures higher up. (Prof. J. Spence, 2.)

FFENBACH'S OPERATION FOR UNUNITED FRACTURE DONE SUBCU- OUSLY.—Dieffenbach's method can be done subcutaneously, thereby ling the tedium, trouble, and danger of a large and deep wound. The sary tools are an Archimedian drill-stock, a steel drill four or five inch- ng, and a few ivory stilettes of the same length and diameter (or slight- pering) as the drill. The drill and stilettes are similarly graduated in inches, and the ivories are, moreover, grooved like a director, in order to along the drill. The *modus operandi* consists in entering the drill gh a puncture made by a tenotome down to the bone; the depth of oft parts is now read off by means of the graduations, then if it be de- to bore into the bone to the depth of an inch, the drilling is proceeded until the steel has penetrated an inch further than the original reading. ivory stilette is now *filed half-way through* an inch from the point, and being soaked in carbolic oil is guided by its groove down along the to the brink of the perforation in the bone, from out of which the steel xt lifted, the ivory slipped into its place, hammered, and by a smart al motion broken off at the filed notch. The operation is completed by drawing the remainder of the stilette and sealing the puncture with a f lint and plaster. Thus an inch peg is accurately placed in an inch leaving no portion projecting into or from the flesh. The graduations e ivory are for the purpose of comparison with the depth indicated pre-

viously on the drill, and it should be observed that the readings tally before the stilette is broken off. The reason why the stilette is grooved instead of the drill is that when the peg is driven home a channel is thus provided for the escape of inflammatory fluids, which would otherwise be pent up in the bone. By the means first detailed three pegs were successfully inserted around the fracture—one in the upper and two in the lower fragment; the punctures healed kindly in twenty-four hours without the development of pus or any constitutional disturbance ; even the local irritation was far less than expected or desired. Whether the result to the patient be successful or not, the practicability of subcutaneous pegging has been safely demonstrated. (Dr. M. Hill, p. 98.)

Excision of the Elbow-joint.—Mr. Maunder's plan seems an excellent one. He describes it as follows :—I performed excision on a method which I suggested to the profession as a *certain* means of securing active extension by the triceps—a desideratum hitherto only rarely, and then accidentally, attained. Briefly put, my object is arrived at by avoiding all transverse section of the soft parts lying between the point of the olecranon and the external condyle of the humerus. In this way the continuity of muscular and aponeurotic structures passing from the arm to the forearm is not destroyed. (Mr. C. F. Maunder, Lancet, Nov. 15, p. 695.)

Fistulous Sinuses.—*Elastic Ligature.*—Ligatures of thread for a great many years, even, we may say, from the time of Ambrose Paré, have been employed for cutting through certain structures, mainly arteries; but hemorrhoids, nævi, warty and pedunculated growths have constantly been removed by the application of a ligature, and the reason it has not been more extensively available has arisen from the fact that only a comparatively limited thickness of tissue can be cut through by *one* application of the ligature, which, as suppuration takes place, becomes loose, and then does not penetrate further unless it be retightened; it is only therefore small and soft growths that can be safely and advantageously treated by the thread ligature. To all these methods there is some objection, either severe pain is caused, or the ligature has to be constantly retightened. In my experience, now, I do not think it necessary, or even desirable, in ordinary tissues, to fix the ligature, so tightly around the part to be severed as I formerly did. I believe a slighter equable pressure will effect safely and more painlessly all we require. In fact, the elastic ligature does not so much cut as gradually compress and render dense the part contained within the loop, and this is how its action differs from inelastic ligatures—ulceration taking place on both sides of the loop, so that when the ligature comes away, actually a portion of the tissue is found contained in it; so hard, dense, and semi-transparent is this as to resemble horn. In my earlier operations I used a small drainage-tube tied in a reef knot, as recommended by Prof Dittel ; this does not answer so well as the solid india-rubber used by Sir Henry Thompson, and I never now tie a knot, as the knotting very easily breaks the india-rubber ; but I adopt a plan I will presently describe. In my early cases, when employing the drainage-tubing I twice had to tighten the ligature, as I thought it was not exercising sufficient pressure ; but I now know this need scarcely ever be done if the ligature be properly adjusted at first. I have now used the elastic ligature in 40 cases of fistula-in-ano, five of hemorrhoids, two of sinus in the groin and one in the neck, two removals of scirrhous breasts, two cases of pedunculated tumours, two cases of varicocele, also in cases of varicose veins, division of the sphincter ani, linear rectotomy, and nævus. (Mr. W. Allingham, p. 108.)

Fractures of the Lower Extremities.—*Extension Pulleys.*—Having to treat a compound fracture of the thigh where the wound was so placed that even the bracketed long splint could not be used, I tried the extension pulleys, and found that method so effective, that I tried it in ordinary cases, and have found it so simple and effective, so much more comfortable to both patient and surgeon, that I now rarely use the long splint—almost never, except for clinical instruction, that students may see more than one method of treatment. Now, after some years' experience in the use of the extension pulleys in fractures of the thigh in very young children and in adults,

in fracture of the neck of the femur in old persons, and in long oblique fractures of the tibia, I unhesitatingly commend the method to all who may not have tried it. Of course, in fractures of the shaft of the femur, lateral splints are required, just as when we use the long splint, and also for lateral support in fractures of the leg. When there is much bruising, however, I merely use sand-bags to prevent lateral displacement; and I also prefer deep sand-bags to prevent rolling of the limb outwards in fractures of the thigh, to a long lateral splint, as used in America. In fact, the full advantages of the extension pulley method are only secured when we abandon the perineal *lacque* and long lateral splint, and make the body the counter-extending force. (Prof. J. Spence, p. 98.)

KNOCK-KNEE.—*New Operation for certain cases of.*—In a case of aggravated knock-knee from a curve inwards of the lower end of the femur, there seemed two courses open in order to put the limb into a straight position. These were to take out a wedge-shaped piece of bone from the shaft of the femur, at the point of flexion, or to take off an oblique slice of the condyles, principally of the inner condyle. The latter operation was determined upon. An incision, about five inches in length, was made along the inner aspect of the knee-joint, the articulation opened into, the internal lateral ligament cut across, and the patella and its ligament being drawn outwards, the crucial and external lateral ligaments were also divided. An oblique slice was then sawn off from the condyles of the femur, the tibia not being interfered with. After the removal of this slice of bone, the leg was readily brought into a straight line with the thigh; and a drainage tube being inserted into he cavity of the joint, a few sutures were applied, and the limb placed on a ire splint, in the straight position. The whole operation was performed nder the antiseptic spray, and the usual antiseptic dressing was applied to he wound. Nothing could go on more favourably, as very little suppura- on took place and the wound became soundly healed. Ultimately the only nperfection of the limb was a want of mobility of the joint, but this was to great extent overcome by forcibly flexing it under chloroform. I am not ware that this or any similar operation has been before practised in ases of knock-knee, but the successful result obtained in the case reported, ncourages me to recommend this method of operating in certain aggravated ases of the deformity which have resisted the division of the biceps ten- ons, or other tense structures, and carefully-applied mechanical treatment. fr. T Annandale, p. 101.)

OPERATION UNDER CHLORAL HYDRATE.—The authors record a case of a elicate-looking female child three years old, which was put under the influ- ice of chloral, and the third metatarsal bone of her left foot removed for isease. An aqueous solution of chloral was prepared, of which 20 minims ntained 12 grains, and they had also at hand a solution of strychnia of 2 rains to the ounce. At 10.30, 10 minims were injected subcutaneously into ie right lower leg; the child cried continuously for some minutes. At).40, 10 minims more were injected, and the child given to its mother to arry about. 10.45, drowsy, but easily roused; starts and cries suddenly, id as suddenly ceases. 10.55, 10 minims more injected into the left lower g; sleeps quite soundly; no flushing of face; wakes in a moment, and is sleep again in a moment. 11.5, 10 minims administered by the mouth; be- ins to snore; pinching makes her cry, but she sleeps immediately. 11.15, 0 minims more administered by the mouth. 11.20, seems now in a deep eep; pinching does not awake her. The operation was now performed. uring its performance she began to cry, but made no struggling. The eyes emained nearly shut, and the crying seemed like that of a dreaming child. he ceased crying immediately the operation was done, and was fast asleep in moment. She was allowed to sleep for two hours. Strong tea was then repared, of which she was made to drink a cupful, and in another three uarters of an hour she sat up, dazed-looking, but quite unterrified, and pparently oblivious of any pain. The solution of chloral was too concen- ated, and made deep wounds afterwards, which, however, healed up well nough. (Mr. G. J. S. and Dr. A. Nairne, p. 100.)

AFFECTIONS OF THE SKIN, ETC.

INDOLENT ENLARGEMENTS OF THE CERVICAL GLANDS.—*Hypodermic Treatment.*—In carrying out hypodermic treatment the cure may be effected either by resolution or by destruction. In the former case absorption takes place; in the latter the injection is followed sooner or later by suppuration. It is desirable, if possible, to cure by resolution. I have found acetic acid, as recommended by Dr. Broadbent for the treatment of certain kinds of cancer, the most useful remedy for this purpose. With this agent I have treated twenty-seven cases; of these fifteen were completely cured by resolution, four were greatly benefited, in five suppuration took place, and three patients discontinued treatment without any decided effect having been produced. I have used the ordinary dilute acetic acid of the British Pharmacopœia, and have generally injected from five to twenty drops, according to the size of the gland to be treated, seven or eight drops being an average dose. The injection should not be made more than once a week. The fluid should be injected well into the middle of the gland. Suppuration has generallly resulted from the solution having been injected either too frequently or too superficially. If suppuration take place the fluid should be draw off with a hypodermic syringe or aspirator. The average duration of treatment by resolution is three months. (Dr. M. Mackenzie, p. 175.)

The best cases are those where a single cervical gland is hypertrophied in an otherwise healthy (adult) subject. Five or six injections of the simple tincture of iodine (five to ten minims at a time, according to the size of the tumour), at intervals of about four days, generally effect a cure. The earlier stages of strumous hypertrophies are also very successfully treated by this method, as are the small hard multiple lymphomata; but in the later stages of strumous disease of the cervical glands, where the tumour is broken down into a mass of caseous matter, and the neighbouring skin is blue and undermined, no good results follow from the injection of iodine; and, indeed, these cases are best treated by a careful excision of the disorganised and degenerated glands. I have also recently employed iodine injections in a large and hard fibroid bronchocele, which had been treated unsuccessfully by the internal administration of the drug. The tumour was not only inconvenient from its size, but had almost destroyed the voice, and so pressed on the trachea as to deflect it to the right side of the neck. The case is still under treatment, but the first two injections of ten minims of iodine were followed by the dimunition of an inch in the girth of the neck. By parity of reasoning we may expect this method to prove serviceable in uterine myomata and allied growths. (Mr. S. M. Bradley, p. 176.)

PLASTIC OPERATIONS.—*New Method of Performing.*—Tagliacozzi recommended 300 years ago that the fresh material for repairing injuries or defects of the face should be taken from the arm. This, however, became gradually abandoned on account of the inconvenience of the posture required. As the result of experiments upon animals, it has been found that the isthmus of living tissue to connect the transplanted part with its original seat is not necessary, and this has been found to be also true in the human subject. This is however one condition—that the cellular tissue should be cleared away from the transplanted parts, as much as possible. The following is an example, showing how this principle of action may be applied to the formation of a new eyelid. I formed a new lower eyelid in the following manner. The edges of the upper and lower eyelids having been vivified, I introduced three ligatures into the border of the lower eyelid, which I entrusted to my assistant. By means of these ligatures, he used traction, whilst I dissected the whole of the cicatricial tissue, and thus liberated the subjacent structure. The ligatures were then introduced into the upper eyelid, and the edges of the upper and lower eyelids were thus united. I then elevated the edges of the wound, preparing them to receive the new flap like a watch-glass. The skin required for the formation of this eyelid was two inches in length and one inch in breadth, which I took from the forearm. To test

nciples above indicated, I divided my flap into three portions. The removed, along with the cellular tissue, as close to the dermis as com- with the integrity of the flap. The other two portions, after removing rom the forearm, I turned up ; and with a cataract-knife, I sliced off olar tissue, leaving a white surface, which I applied to the eyelid. The ace between these flaps was very remarkable. The two flaps which reviously prepared, healed by agglutination, without exhibiting even ghtest tendency to desquamation of the cuticle. Twenty-four hours e operation, the surfaces looked pale ; but the next day the tempera- s normal, and appearance healthy; whilst that part which was applied t previous preparation looked rather livid the first day, improved the vo days; the fourth day, it began slightly to suppurate; and, after a ruggle for life, a portion of it only remained, whilst the rest shrank. owever, will not compromise the result of the operation, which may idered satisfactory. (Dr. J. R. Wolfe, p. 172.)

LIGO AND TINEA FAVOSA.—*Petroleum.*—Petroleum is a safe and sim- edy for the cure of paralytic cutaneous affections of the head. Hav- pped, or better still, shaved the head, let poultices be applied a few then let the petroleum be applied twice daily in the form of one part um to two of lard, and a few drops of oil of lavender. The ointment e moderately warmed before application. After the application a f dry soft clean linen rag may be laid on—an old cambric handker- nswers very well—and over all, a soft clean linen cap. Before the next tion of the petroleum ointment, the head must be thoroughly but washed with black or fish soap and fresh warm soft water. The oint- then to be reapplied as before. Every rag or cap, once used and past use, should be thrown into the fire, but if intended for further use, d in a hot soda ley, and after being well washed, finally rinsed in wa- taining a little carbolic acid. (Dr. H. Maccormac, p. 174.)

SIASIS.—*Tar Internally.*—I have come to regard tar in the light of one most valuable remedies we possess in the treatment of psoriasis. And t merely in mild cases that it does good, for it has, in my hands, fre- y yielded the most satisfactory results in very obstinate cases after ourses of arsenic and many other orthodox remedies had been tried in Perhaps it may be that the dose and mode of administration of the y have something to do with the difference of the results obtained by uire and myself; and, therefore, it may be well to state that I general- in with two minims three times a day in a teaspoonful of treacle, and lly increase the dose, if necessary, to half a teaspoonful, or even The small dose is advisable at first, as in some persons the medicine be tolerated, and produces derangement of the digestive organs, fever, right red rash upon the skin. I can testify also to the virtues of th is in catarrh of the bronchial tubes, as pointed out by Dr. Ringer, and in affections of the mucous membranes generally ; and I conclude with mark that it is very singular how such a valuable remedy, which seems ier days to have been highly esteemed, should, as an internal medi- ave fallen into such disrepute in our own time. (Dr. T. M'Call Ander- ritish Medical Journal, April 24, p. 537.)

AFFECTIONS OF THE EYE.

IFICIAL MEMBRANA-TYMPANI.—There is much uncertainty in the use artificial membranæ-tympani invented respectively by Yearsley and ee, sometimes one being found of service, and sometimes the other. strument to be described is a combination of the two. It is simply a ation of Toynbee's artificial membrane, viz., a thin disc of india-rub- unted on a fine silver-wire stem, and Yearsley's cotton-wool. In my nent, the wire is carried beyond the india-rubber for about a quarter nch, and *terminates in a* second disc, made of flannel. The space be-

tween the two is filled up with a small portion of Dr. von Bruns' wound-dressing cotton-wool, which is absorbent, and so takes up and communicates to the flannel disc any medicated solution which it may be desirable to apply. To prevent overcharging the cotton-wool, a pipette should be used, as one or two drops are sufficient to moisten every fibre of the wool and flannel. (Mr. G. Field, p. 192.)

Cataract with a Deep-set Eye.—When the eye is deep-set some embarrassment is occasioned in making the corneal section, especially where anæsthetics are not employed. In a case recently operated upon at the Birmingham Eye Hospital, I improvised a simple and effective method of overcoming the difficulty under consideration by making with a pair of sharp scissors a perpendicular incision through the substance of the lower lid of about three-eighths of an inch in length and one-sixth of an inch from the commissure. Steady continuous pressure by means of a small sponge restrained the bleeding within innocent limits. The front of the eye having been now made easy of access to the knife, the section of the cornea was completed without difficulty, and the lens safely delivered without accident. No anæsthetic was employed. The lid was not sutured, but dressed with cerate instead of dry rag, and two turns of a narrow domett roller. The patient, a collier of sixty-eight years, recovered without a single painful or unfavourable symptom, and was discharged cured on the fourteenth day of the operation, with a clear black pupil, good vision, and perfect cicatrisation of the tarsal cartilage. (Mr. J. V. Solomon, p. 191.)

Local Treatment of Eye Diseases.—In diseased conditions, when the conjunctiva and cornea are roughened by the projection of distended blood-vessels, and when the natural secretions are altered or diminished, and especially when there is any abrasion or loss of the corneal surface, the friction of the lids becomes not only painful, but injurious, and the movements are at the same time increased in energy and frequency by reflected irritation. It then becomes necessary that they should be restrained; and for this purpose we employ what is known as a "compressive bandage." There are many circumstances under which it is desirable to apply cold or heat to the eye; the former to moderate, the latter (as in the case of sloughing ulcers of the cornea) to promote vascular action. For these purposes we employ compresses of various kinds. In order, however, to obtain complete physiological rest to the eye, it is necessary to have recourse to the use of atropine, which establishes complete internal passivity of the organ. For this purpose a solution of two grains to the ounce of distilled water is absolutely unirritating. If pain is produced by its use, the probability is that the drug is impure or not neutral. At hospitals we constantly see children for whom atropine has been prescribed, but whose pupils are not dilated. Occasionally, perhaps, no one at home has taken any trouble about the matter; but more frequently, I believe, the drops have gone over the cheeks, or anywhere but into the eyes, or they have been applied so roughly as to produce plentiful crying. In hospital practice such children can be brought every day, so that the application may be made effectually; and it will often be desirable to use, instead of the solution, the little wafers of atropinised gelatine which were devised by Mr. Streatfeild. I do not like these wafers for common use, because they often produce too much smarting; but for crying children they have a great advantage in the fact that they dissolve slowly, and that the medicament is not liable to be at once washed away by a gush of tears. (Mr. R. B. Carter, p. 185.)

VENEREAL AFFECTIONS.

Inherited Syphilis.—No one who has watched the effects of mercury given in cases of inherited syphilis ought to doubt the potency of at least that drug. We know few things in therapeutics more satisfactory than *to witness the* improvement of children thus treated; they rapidly fatten,

lose their shrunken aspect, and change from little old men to actual infants; the eruptions fade, the sores heal, and the progress is often astonishing. (Ed. of Brit. and For. Med.-Chir. Review, p. 283.)

SYPHILIS.—When the period of primary syphilis has long passed away, and when mercury has been given for a few weeks, it is very difficult to decide upon the course to be pursued. We have, then, two remedies between which to choose, mercury and iodide of potassium. Of these, iodide of potassium is the more rapid in its influence upon the symptoms actually present, but it probably possesses little or no power to modify the systemic malady. Nothing in clinical history is more remarkable than the rapid amelioration of the symptoms of late forms of syphilis under the use of the iodide; nothing is more certain, generally speaking, than their recurrence in the same or in some modified form. Mercury, on the other hand, will be slower in producing its first action, but more effectual as against the syphilitic taint; although it is not proven that syphilis of long standing can be cured by mercury, at least with anything like the same certainty as the earlier stages of the disease. In order to obtain a mercurial influence quickly, I use either blue pill, or inunction with blue ointment, or both together; and, for prolonged administration, the perchloride. Inunction is often useful for adults, but its especial value is in the case of young infants suffering from a combination of purulent ophthalmia and inherited syphilis. For them, the plan I prefer is to smear every day a little fresh ointment on a strip of flannel, about an inch and a half wide, which is buttoned round the abdomen, next the skin, and worn constantly. Mr. Hutchinson is accustomed to have the ointment rubbed into the soles of the feet, the only part of an infant's skin on which it never produces irritation. The perchloride combines admirably with iron, or quinine, or arsenic, or with any two of them, and is generally effective in combination than alone. Save in the exceptional cases of idiosyncrasy, in which mercurial poisoning may be produced by a single moderate dose, there should be no such thing as a sore mouth resulting from treatment. The slightest line upon the gums indicates a point beyond which the medicine should not be pushed: and the highest art of administering mercury is to keep the patient, as it were, on the brink of this line, without permitting transgression of it. (Mr. R. B. Carter, p. 182.)

Ricord's Treatment.—From the evidence gathered during an experience which is nearly as unparalleled in its duration as in its extent, he tells us that syphilis is radically and permanently curable, but that it cannot be cured, as a rule, otherwise than by a course of mercury continued, with due intermissions and precautions, for something like twelve months. Less than this will, indeed, in most cases, leave the patient apparently well, but the disease will again declare itself at some future time, and often in some of the obscure forms the nature of which we have only just learned to recognise. (Mr. R. B. Carter, p. 181.)

In all cases of syphilis in which you employ mercury, remember that you have two objects in view: the first, to cure the present symptoms; the second, to prevent a return of the disease. It seems to me that a great number of practitioners at the present day regard only the first object, and lose sight of the second. I have frequently seen a person who has taken mercury for a chancre, which has, perhaps, healed in a fortnight, and then has left it off, although a very hard cicatrix has been left. Under such circumstances, in nineteen cases out of twenty, there will be secondary symptoms. If mercury be taken for the primary symptoms, the patient should never leave it off till the hard cicatrix has disappeared, nor indeed for some time afterwards; and so, where it is given for secondary symptoms, it should be continued for a considerable time after they have disappeared. A man has an eruption of the body; it fades away, under the use of mercury, in the course of a month; but the remedy must be used as a prophylactic for another month. If a patient be confined to his house, or only allowed to go out a little on a fine day; if he be made properly to rub in the ointment, and the course be carefully watched and continued for some time after the symptoms have subsided, you will, I am satisfied, in the great majority of cases, make a real and permanent cure of the disease. (The late Sir B. Brodie, p. 202.)

The Relation of Soft Chancre to Syphilis.—Can a chancre which presented at one stage all the characters of a soft one subsequently become indurated? The soft sore results simply from pus-contagion, this pus being more or less peculiar, and its peculiarities being due to its having originated in syphilitic inflammation. I have insisted that this pus may or may not contain the germ-matter of syphilis. Let me here insist upon the extreme importance to the reputation of the practitioner of the rule never to give an opinion as to the nature of a chancre until the incubation period is over. Patients will come to you with sores contracted a few days or a week or two before, and will expect you to be able to tell them whether or not they are likely to have syphilis. Now, there is never anything in the conditions which are either present or absent which will justify the most practised observer in giving any opinion at such a stage. It is very rare indeed that an infecting sore acquires any induration within three weeks of the date of contagion, and more commonly it is a month or five weeks. Until such induration take place, nobody can tell whether it is coming or not. Let your rule be, I repeat, to give to your patient no opinion whatever as to his chance of escape until he can assure you that it is one month since his last exposure to risk. If the virus be introduced in a pure, or almost pure, state, then it is probable that in many cases the patient experiences nothing excepting, perhaps for a few days, a litttle red pimple, which disappears, and leaves him, as he thinks, quite well for another three weeks or a month. At the end of that time the part begins to itch a little, and again becomes red, and gradually within a week or so a well-characterised induration is developed. If, however, the contagion have been effected by a mixture of contagious pus and specific virus, then you have a very different course of things. Within the first few days the contaminated part may inflame sharply, and an ulcer may result which will probably send the patient in great alarm to his surgeon. This sore is, of course, soft; it secretes freely, and its secretion may contaminate other parts, and you may have what are termed multiple soft chancres. You may inoculate it, if wished, on the patient's skin, and produce other similar sores, and thus prove that you have to do with a non-specific secretion. But all this does not prove that the specific poison is not there, and whatever may be the cause of these soft sores, whether easy to heal or obstinate, there remains the risk that the specific induration may ultimately be developed. Probably the worse the sore, the more inflammation, and the deeper the ulceration, the greater is the patient's chance that the specific virus may be thrown off; whilst if the sore heals in a few days the danger of true syphilis is considerable. We often, from patients who are the subjects of tertiary disease, hear the statement that the original sore healed in a week, and gave scarcely any trouble. Such cases are, I suspect, examples of the early healing of a conspicuous soft sore, which was followed some weeks later by an inconspicuous and unobserved hard one. It is becoming increasingly the rule of English practice to give mercury as soon as ever specific induration can be recognised; but it is quite possible that we may, in the future, go further than this, and think that it is best to prescribe this remedy for all sores occurring within a month of contagion. We should no longer do so under the impression which formerly prevailed, that it was necesary in order to make the sore heal, for we now know that the soft sore is not syphilis, and cannot be influenced by its specific. The reason for giving it would be the fear that the patient may be passing unnoticed through the incubation stage of a true chancre. The soft sore proves that he has been contaminated with venereal pus, and shows that it is not improbable that he may have received the syphilitic virus also. It is quite possible that the antidotal efficacy of mercury may be much greater in the early stage than in the later ones. I wish, however, to have it distinctly understood for the present that I am merely suggesting, and not recommending. I am often pressed by patients to allow them to take mercury on speculation for soft sores, but hitherto have for the most part declined to do it; my reason being, that *until some* proof has been afforded that we have to deal with true syphilis, we *have no* data by which to determine the requisite length of treatment. (*Mr. J. Hutchinson*, p. 204.)

MIDWIFERY, ETC.

ADHERENT PLACENTA.—The *treatment* of adherent placenta should be prompt, because this complication is generally accompanied with hemorrhage, which may speedily become dangerous. It is never safe to leave such cases long to the unaided powers of nature, or to rely on ergot, styptics, or any kind of drug. The hand of the accoucheur supplies the only safe and effectual remedy. To employ this remedy properly, some coolness and dexterity and a considerable amount of patience are required. The hand has sometimes to be kept in the uterus for half an hour or more before the operation can be completed. In the ordinary obstetric position, the woman lying on her left side, the left hand will be found to be much the most convenient for this purpose; but, to perform the operation properly, both hands should be used. If the cord be tightly encircled by the os uteri, the constriction should be overcome by insinuating the tips of the fingers into the os in a conical form; whilst the right hand all this time is making counter-pressure upon the fundus uteri, so as to steady that organ. Should these precautions be neglected, the connections between the vagina and the uterus may be put very injuriously on the stretch, especially if the circular fibres of the os oppose much resistance to the introduction of the hand. As the tips of the fingers pass through the os, they should be gradually expanded and separated from one another, until, by sheer fatigue, they overcome the contraction of the uterine fibres, so as to allow the passage of the entire hand into the uterus. When this is accomplished, the next step is to pass up the hand sufficiently high to reach the placenta. The distance which it has to pass before this can be felt will depend very much upon the position of the placenta and the degree of contraction of the uterus. If the placenta be attached, as it usually is, to the fundus uteri, or if the uterus be in a flaccid condition, it will be necessary to pass the hand much further than when the placenta is attached lower down, or when the uterus is well contracted. I have sometimes had to pass the hand quite into the epigastric region in search of a retained placenta. As soon as the placenta is arrived at, the fingers should be spread out, taking care not to entangle them in the membranes, until the circumference of the placenta can be felt. If any portion of the circumference be already detached, the tips of the fingers should be cautiously inserted between this portion and the inner surface of the uterus, and the placenta gradually peeled off. All this time the right hand, externally applied, steadies the portion of the uterus from which the left hand is detaching the placenta, and enables the accoucheur to estimate the exact thickness of the uterine walls included between the hands, so that he can avoid digging his nails into the substance of the uterus. (Dr. J. G. Swayne, p. 222.)

DYSMENORRHŒA.—It very rarely indeed happens that any service is found to arise from operations on the uterus for the cure of dysmenorrhœa, while occasionally pelvic abscess and pelvic peritonitis have been known to result from such interference. There is still too great a tendency to expect to find an evident physical cause for all painful menstruation. Spasm and neuralgia are quite sufficient to account for the vast majority of cases. No doubt membranous shreds are frequent causes of obstruction to the menstrual flow. The rational teatment of dysmenorrhœa, commencing at an early period, consists in the use of cold baths in the morning, with short walks in the open air afterwards; in hot baths a few days previously to the menstrual periods; and in palliative treatment of paroxysms at the time of occurrence. (Dr. C. R. Drysdale, p. 212.)

EPITHELIAL TUMOURS OF THE NECK OF THE UTERUS.—M. Labbé sums up the advantage of this method of treatment in the following propositions:—1. The removal of the tumour is so rapidly effected, the time not exceeding thirty to forty seconds, that chloroform is unnecessary. 2. Besides the rapidity with which the ablation is accomplished, the cut surface is so smooth and free from bleeding that there is little chance of secondary hemorrhage. 3. The platinum wire is so supple that it can be applied without any effort being made to drag

down the uterus. 4. The mode of application of the wire requires no instruction. It is important, however, that when it has been made to glow by the passage of the current, it should be pressed well into the new growth to avoid injuring the healthy parts, and this he effects by a special apparatus with screw. As soon as the removal is effected a cold vaginal injection follows, and as a matter of precaution it is well to place a pledget of lint dipped in perchloride of iron on the wound. (Practitioner, Aug., 1875, p. 141.)

Fibroid Tumour.—*Disappearance of Fibroid Tumour during the Administration of Chloride of Ammonium.*—Dr. F. W. Hatch relates, in the Pacific Medical and Surgical Journal, the case of a woman aged 39 years, who had a tumour in the abdomen extending from the pelvis upwards and towards the left side, above the umbilicus, and who had neuralgia of the supra-orbital and temporal regions of one side. For the latter affection chloride of ammonium was given to the extent of sixty to eighty grains daily, in divided doses. The relief to the neuralgia was very marked, and at the same time the abdominal tumour, which Dr. Hatch regarded as a uterine fibroid, diminished, and before the end of the year had disappeared. (Practitioner, May, 1875, p. 366.)

Impregnation, and the Discharge of Ova.—Dr. Williams has come to the conclusion that, in the great majority of cases, the discharge of ova takes place *before* the appearance of the menstrual flow with which it is connected; for in ten out of fourteen cases rupture of a follicle or hemorrhage into its cavity had occurred before the return of the catamenia; in one it was doubtful whether rupture of a follicle or the appearance of the discharge would have taken place first; in two a menstrual period had passed without the maturation of a follicle; and in one a periodical discharge was imminent, though the ovaries contained no matured Graafian follicle. (Dr. J. Williams, p. 211.)

Inoculation with the Septic Lochia of Puerperal Women.—Dr. Stewart, of Barnsley, relates two cases of inoculation of wounds of the hand with the septic lochia of puerperal women. The first case resulted in gangrene of the hand and death. The woman from whom the inoculation was received was suffering from puerperal peritonitis. The second case recovered, but had suppuration in the cellular tissue of the hand and forearm which required free incisions. From these cases Dr. Stewart draws the conclusion that the passage of decomposing lochia over any abraded surface in the vaginal passage is sufficient to produce puerperal septicæmia without the importation of any other specific poison. In this manner, we may account for the disease attacking much more frequently primiparous cases, as the vagina and perineum are much more likely to be slightly lacerated in those than in multiparæ. (Dr. W. Stewart, p. 230.)

Instrument for Removal of Growths from the Female Urethra.—Messrs. Krohne and Sesemann have made under the direction of Mr. Thomas Bryant (Guy's Hospital) a simple instrument to facilitate the removal of growths from the female urethra by means of the galvanic cautery. The instrument is a dilator, speculum, and protector. As a dilator, it is readily introduced without any previous dilatation, when the patient is fully under the influence of an anæsthetic; and it can be rotated, and moved backwards and forwards. As a speculum, it allows inspection of every part of the canal, and exposes to view any growths (the growths falling into the slat of the instrument) which may be situated at the anterior or posterior part of the urethra. As a protector, it covers every part of the canal with a non-conducting surface, leaving only the growths exposed; these can thus be readily removed with a platinum wire loop, or destroyed by a larger or smaller cautery, galvanic or otherwise. Mr. Bryant's dilators are made in sets of three different sizes, of boxwood and of ivory. They have been already freely used, and with marked success. (Obstetrical Journal, July, p. 247.)

Placenta Prævia.—The plug is the treatment *par excellence*. It requires to be applied skilfully to be of any great use. Charpie or tow are the best materials with which to plug, and if properly applied, the author considers such a plug superior to any description of india-rubber bag which can be introduced into the uterus and inflated. The great point to attend to when

plugging is to introduce enough of the charpie or tow, as much as a pound and a half of the former material being sometimes necessary. The bladder and rectum should both be emptied before we proceed to plug. Some practitioners dip the first pledget in a solution of perchloride of iron. This is not necessary. The charpie should be rolled into small balls, the first twenty or thirty of which should have a piece of thread attached. Before being introduced they should be well covered with cerate. This renders a speculum unnecessary. It is most important to pack tightly the anterior and posterior cul de sac, but especially the latter. The vagina should be filled until the material appears externally. Over this three or four compresses should be applied and the whole fixed by a T bandage. The plug should be left in from 12 to 24 hours. (Dr. Charpentier, p. 222.)

PROLAPSE OF THE UMBILICAL CORD.—*Postural Treatment.*—Place the patient in the knee-elbow position, and, the hand being passed partially or completely into the vagina, just as a pain is coming on push the loop of cord alongside of the head. As the head is forced down the cord will disappear, and will generally not again prolapse. (Dr. J. Brunton, p. 213.)

PUERPERAL FEVER.—Undoubtedly many cases of puerperal fever are induced by poison introduced from without, either pyæmic, scarlatinal, or erysipeloid, but another class of cases have an autogenetic origin. For example, you see a woman in the country away from all sources of infection; a little bit of the placenta is retained, a clot of blood is there, or some change takes place in the uterus, and there is an element of infection; it runs along the veins or the lymphatics, is absorbed by the mucous membrane; then you get the blood tainted, and the slightest matter will set it going; the whole system is in a ferment, just as it was from the poison of scarlet fever or typhoid; you may call it pyæmia or septicæmia, the result is about the same. These cases come on a little later than those which have a zymotic origin, and they can often be arrested by washing out the uterus, and bringing away any superfluous matter there. (Dr. R. Barnes, p. 225.)

It is my impression, from all that I have seen, that the manner in which this communication takes place is, in a large proportion of cases, by means of the hand, and I believe that the spaces beneath the nails, and under the skin which covers the nails, are exceedingly liable to harbour these animal destructive products; I do not say that they are limited to those parts; the skin of the fingers may also be their habitat. We know what sometimes takes place after a post-mortem examination, when it is exceedingly difficult to get rid of the smell of the corpse from the hands, cleanse them in whatever way you will. I am speaking now more particularly of what happened some years ago, before carbolic acid and other disinfectants were much known or used. It is not so difficult now as it was. At all events, I believe that the nails and the neighbourhood of the nails are the parts more particularly liable to harbour these infecting materials. It seems to me rather unlikely that the clothes carry infection so readily. Of course, where a person allows the cuffs of his coat to be dipped in putrescent material, and then makes an examination of a patient in child-birth, something may happen after that. On the whole I think the hand is particularly efficacious in this matter. I share the opinion that very great attention should be bestowed on cleansing the hands in all cases where they are to be used in midwifery practice. A good deal has been said of late years in reference to the armamentaria that medical men should be provided with; and I think a useful addition would be a pot of carbolic ointment and a nail-brush. In the next place I would remark that it has seemed to me that any animal poison introduced from without may produce what we term puerperal pyæmia, the same as may be produced by a student who is handling surgical wounds in the hospital, and attending midwifery cases. (Dr. Graily Hewitt, p. 228.)

Puerperal fever is nothing more nor less than septicæmia. We have more than one substance—one in particular—that will not tolerate the presence of putrid animal matter or septic poison; this drug is iodine, which as soon as it is brought into contact with septic matter, is converted into two harmless substances. Let any medical practitioner who has been in attendance on any case, whether a parturient female or any other, where there happens to

be putrid emanation, wash his hands in water into which he has poured tincture of iodine, and I will answer for it he has no septic matter under his finger-nails. Again, if he fancies that his clothes, hair, and skin are saturated with it, let him go into the watercloset (I mention that as the smallest room in the house), place a few scales of iodine on a plate, and put a spirit-lamp under it, and he will soon find himself surrounded by a violet vapour which will fall upon him in a shower of minute scales, from which he has only to protect his eyes. If he then carries with him any of the puerperal poison, my whole theory of the disease must be wrong. One thing I can assert, that in my own practice I have never had a case of fatal puerperal septicæmia since I have used iodine as an antiseptic, now more than twenty years ago. Iodine is equally efficacious in warding off septicæmia in other surgical diseases. I have injected solutions of septic poison under the skin of guinea-pigs, and produced death by septicæmia; I have also injected some of the same solutions, into which I had dropped a few drops of tincture of iodine, without producing any ill effects. It is needless to observe that the prevention and the cure of this disease go hand in hand together. Should any septic poison be present in the puerperal woman, wash her out again and again with solution of iodine until the solution comes back the same colour as it was thrown up. (Dr. W. Williams, p. 234.)

It is the duty of every practitioner to avoid, as far as possible, any communication of the effluvia, secretions, or emanations of fever, erysipelas, pyæmia, unhealthy sores, or the like, to his obstetric patients. This implies that he shall use all the precautions which modern science or his own knowledge recommends, such as the use of antiseptics, change of clothing, selection of time for visiting, and the like; but cannot possibly imply, in the present state of society, that no general practitioner shall, with proper care, visit simultaneously any cases of infectious disease and cases of confinement. One of the most important precautions, however, is to abandon for a time the practice of midwifery whenever the practitioner is compelled (using Dr. Duncan's own word) to nurse a case of scarlatina, &c. By nursing, I mean to very frequently visit, stay with, or handle as a nurse does: the only means of saving many cases of fever. When a group of symptoms, probably due to septicæmia or approximating to that popularly termed puerperal fever, has occurred to a practitioner, he should redouble the usual precautions: and, if he meet shortly with a second case in his own practice, he is morally bound—I suspect legally also—to abstain from midwifery practice for some weeks. If Dr. Duncan could by statistics, of which he is so great a master, and which seem invariably to obey his command, determine the exact time of necessary quarantine, he would confer the greatest possible obligation, in more senses than one, upon the medical profession. A professed obstetrician should not indulge in *post-mortem* examinations, or other probable sources of septicæmia. (Dr. J. Thorburn, p. 232.)

Puerperal Fever and Erysipelas.—Mr. Squire, of Wivenhoe, had a case of scalp wound, which he dressed just as an attack of erysipelas was, unknown to him, commencing in it. Directly traceable to this he had nine cases of erysipelas and two of puerperal fever, with six deaths. (Mr. S. N. Squire, p. 236.)

Sickness of Pregnancy.—Pass the finger into the os and slightly dilate it till the puckered edge is smooth. This will not bring on premature labour. Judging by three cases in which this plan proved successful, after all other means of treatment had failed, the os will be found patent, puckered, and dilatable. This means of cure was accidentally found out in a case which was so serious as to appear to necessitate the induction of premature labour. The os was slightly dilated by the finger in the manner described, but nothing further was done at the time. The sickness ceased at once, and the patient went to the full term of pregnancy. (Dr. E. Copeman, p. 208.)

In a case of such obstinate vomiting in pregnancy that it was decided to induce premature labour, the os was dilated with the finger, and then to some extent with Barnes' smallest bag. From the time that this was done all vomiting ceased, and some nourishment was taken. The bag was removed, and further interference deferred. The next day, however, she was sud-

daily delivered, a slight pain being the only previous warning. So far as it goes this case corroborates the observation of Dr. Copeman, of Norwich. (Dr. J. Thomas, p. 210.)

Ulceration of Cervix Uteri.—*Nitric Acid.*—Nitric acid, as a caustic in uterine practice, is preferable to nitrate of silver and to potassa fusa. Nitric acid is a really efficient caustic, producing a slough, which is peculiarly firmly adherent, and which consequently necessitates a healthy effort by the subjacent parts for its separation. The only other caustic which produces a slough of the same character is nitrate of mercury. Nitric acid moreover requires no special preparation; it does not spread like potassa c. calce, nor is its action so deep; it produces little or no pain and no hemorrhage. These advantages are trivial compared with the fact, that when once it has been properly applied, in many cases no further interference is necessary, and thus the frequent use of the speculum may be done away with. The acid is best applied by means of a small and tightly rolled piece of cotton-wool, which is to be placed by an ordinary speculum forceps in contact with successive portions of the surface until the whole is covered with a white eschar. In a case of chronic endocervicitis, the acid should be applied to the interior of the open cervical canal, and if it is not open the case is not one suitable for the treatment. The contraction which accompanies healing is only to a healthy and natural degree. Provided the caustic has been used with ordinary prudence, I have never seen anything but good follow its use, and the ease with which a chronic case of cervical catarrh, with ulceration or erosion, may be cured by it is something marvellous. (Dr. James Braithwaite, p. 207.)

MISCELLANEA.

Changed Aloin.—*A New Aperient.*—Aloin is a crystallizable substance procurable from aloes, and supposed to be its active principle. It possesses all the purgative properties of aloes. A solution of aloin set aside for some months deposits an uncrystallizable substance denominated "changed aloin." It is soluble or easily reducible to a fine powder. It possesses the same purgative properties as aloin, and may be given either by subcutaneous injection or in pills containing one or two grains. These pills I administered to various individuals and in very different circumstances, and in all cases found them a mild but certain aperient. I administered these pills to several persons of sedentary habits, and succeeded in removing the constipation so common in such circumstances. I found that one or two grains daily of changed aloin were sufficient to accomplish that object. I also gave these pills to pregnant females shortly before confinement, and in several cases administered them to females a few days after they had been delivered, and in both cases found them to answer exceedingly well. In no case was there any griping, nor did any bad result follow. (Dr. Craig, Edin. Med. Journal, May, p. 1002.)

Chloroform Poisoning.—*Combined Inversion and Artificial Respiration.*—In cases of apparent death from chloroform, if possible, first invert the body, as recommended by Nélaton, and then produce artificial respiration, the inversion being continued. A remarkable case illustrative of this is related, in which respiration and the action of the heart had ceased. Six minutes elapsed before the first feeble natural respiration occurred. (Mr. S. M. Bradley, p. 249.)

Nitrite of Amyl.—The effect of inhalation of nitrite of amyl upon the optic disc is to produce enormous dilatation and engorgement of the blood-vessels (arteries and lens, but especially the veins), leaving no doubt as to simultaneously existing cerebral hyperæmia, with greatly accelerated circulation of blood. This action of nitrite of amyl suggested its probable use in cases of faintness or defective breathing or heart action whilst a patient is under the influence of another anæsthetic. The result of experience in its use con-

firms this idea. It is found to produce a quick restoration of breathing, a good colour, and the rapid appearance of sickness. (Mr. C. Bader, p. 249.)

Ether as an Anæsthetic.—With regard to the efficiency of ether, I may say that I finally abandoned the use of chloroform three years ago. Since that time I have performed at least fifteen hundred operations upon the eye at St. George's Hospital, and a smaller number at the Royal South London Ophthalmic Hospital, using ether as my sole anæsthetic. Its administration requires from two to four minutes, and the anæsthesia which it produces leaves nothing to be desired. It has been in use at St. George's Hospital for a still longer period in general surgery; but until Dr. Joy Jeffries, of Boston (U. S.), taught me, in 1872, the proper method of administering it, I did not consider it available for ophthalmic operations. Unless given with great freedom, it does not completely relax the muscular system. (Mr. R. B. Carter, p. 250.)

For the efficient and safe administration of ether, the following points are needful to be known and remembered. 1st. That kind of ether should be used which is fittest for the purpose of inhalation, and this is the pure anhydrous washed ether, sp. gr. 720; free from alcohol and water. Robbins's "ether for local anæsthesia" is a dangerous compound for inhalation. It was this last which was used in a case recently fatal at Manchester. 2nd. The ether should be given in such a way that the inhalation may be commenced with a very weak vapour, which, after a few inspirations, can be rapidly increased in strength. If we begin with too powerful a vapour, the air-passages are intolerant of it, and the patient resists the inhalation; but after a few moments' inhalation of a weak vapour, its strength can be increased without inconvenience, and the patient rapidly brought under its influence. I think a cone of felt, covered with thin mackintosh, is the simplest and best apparatus for this purpose. 3rd. Stimulants should not be administered before the inhalation. Ether is itself a stimulant, and can be safely given in cases where there is great depression; but, as Mr. Clover has pointed out, it is very undesirable to have alcohol in the stomach when ether is being inhaled. 4th. Whatever danger may belong to ether has relation to the respiratory function. The breathing should therefore be watched; and, I may add, it is desirable so to place the head of the patient that the saliva (the secretion of which is increased by the ether) may run out at the corner of the mouth rather than into the trachea. (Mr. J. W. Haward, Lancet, Aug. 7, p. 228.)

Iodide of Potassium.—*Therapeutic Uses of.*—I think that iodide of potassium has a far wider range of usefulness than in syphilitic cases only; that, like the bromide, it has a manifest influence upon the blood-supply of the brain, and that it cures maladies, such as recurrent nocturnal headache, which cannot be traced to a syphilitic origin, or described as syphilitic except by an abuse of language. Like the bromide, the iodide is frequently given in doses which are well-nigh useless; an error which perhaps arises from the circumstance that some patients are extremely susceptible to the action of the medicine. If we habitually order ten grains three times a day as a commencing dose, we shall find, in nearly all the cases in which the iodide is useful, that this dose may be rapidly increased to double or treble the quantity, or even beyond these limits. (Mr. R. B. Carter, p. 178.)

Salicylic Acid.—*To render it Soluble.*—Salicylic acid is insoluble in water in a larger proportion than 1 part in 300, and the alcoholic solution and the pure acid are both too irritating to be applied to a wound. It has, however, been recently discovered that 10 parts of the acid can be dissolved in 100 parts of water, provided 8 parts of borax are present. The borax must first be dissolved by the aid of heat, and then the acid added gradually to the boiling liquid. The most suitable strength in which this solution can be used for wounds is one which contains from 2½ to 5 per cent. of salicylic acid and 2 to 4 per cent. of borax. (Dr. H. Bose, Berlin, p. 242.)

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THE

RETROSPECT

OF

PRACTICAL MEDICINE AND SURGERY,

BEING

A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M.D.,

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.,

AND

JAMES BRAITHWAITE, M.D., LOND.,

LECTURER ON DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE.
ASSISTANT-SURGEON TO THE LEEDS HOSPITAL FOR WOMEN AND CHILDREN.

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PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

—SOME CONSIDERATIONS RESPECTING INFLAMMATION.

By Dr. C. HANDFIELD JONES, F.R.S., Physician to St. Mary's Hospital.

we endeavour to form some idea of the vital changes taking place in a which is becoming inflamed, we may safely assume as a basis for our deration the following facts: (1) That every arteriole has a contractile ular coat, which, in the healthy state, is moderately contracted, and is so by nerve influence. The existence of a power of active dilatation, gh affirmed by some good observers, does not appear to me at all estab- l, and to be rendered unnecessary by the dilating pressure of the con- d blood. (2) That the capillaries which surround the tissue elements ss a certain normal retentive power, varying in different parts, which nts more than a very small amount of blood fluid from filtering, as it through their homogeneous walls. This retentivity is weakened by s of intra-vascular pressure, whether from venous obstruction or arte- elaxation, and is also probably more or less impaired by loss of or by id nervous influence. The common expression, "tone of the vessels," rehends both arterial contractility and capillary retentivity. The aries are filled with moving blood, which, as the carrier of poisonous r, may no doubt act injuriously on and disorder the tissue, and, on the hand, may be morbidly affected by the tissues themselves. To deter- more precisely the *rôle* of the blood, apart from the tissue, is hardly ble at present. (3) That the tissue elements have a special vital power of own, by which each part is qualified for its special function. These rs may be distinguished for brevity's sake as arterial, capillary, and ional, or tissue power. A fourth power also is present in most, if not parts—viz., the nervous. This may be regarded as influencing more s decidedly the arteries, the capillaries, and the tissue. The arteries ways influenced by it; the tissue often very positively, as in the case of es; the capillaries less manifestly, except in the case of the lacrymal, ry, and urinary glands. It may be true, as Ludwig and Hafiz main- that the arterial nerves of a muscle have a distinct origin and course the proper motor nerves; but there can be little doubt that their cen- xtremities are so connected in the spinal cord or elsewhere that they ifluence each other. Now, in the state of health, as we know, a rela- arying within certain limits subsists between the vasal powers on the and, and the tissue power on the other. This relation is one of *inverse* ion of their manifestations, increased activity of the tissue coinciding lessened of the vasal elements, and *vice versa*. This alternation can y be referred to any other mechanism as its efficient cause than the or nerves with the centre. It is highly probable that nerve force can nverted into tissue *force, and it would seem that the active state of the in some way absorbed or monopolised* the larger amount of the nerve

force generated at the centre, so that the other filaments supplying the vessels were left in a minus state, and were unable to prevent the arterioles from dilating under the pressure of the blood column. The more active the tissue the greater will be the degree of vascular paresis, which, in such cases as severe chorea and tetanus, is known to be sufficient to allow of actual extravasations of blood occurring in the affected nerve centres. When the tissue ceases to act the vasal nerves regain force, the vessels again contract, and the blood supply is diminished. So far all is normal. But if the tissue excitement be excessive and abnormal, if the functional power be lost in morbid and purposeless action, the nerve will remain in a state of paresis, the vessel relaxed, and the hyperæmia will be persistent. Fluid and corpuscles will escape from the capillaries, and inflammatory products make their appearance. Admitting the correctness of the observations, which go to prove that the corpuscles of an inflamed part proliferate and generate pus or exudation cells, we have herein a proof of the disturbed, disordered vitality of the affected part, which we have made the prime motor of the inflammatory process. Such inflammation as this I termed long ago tissue inflammation, to mark that in it the disorder of the tissue was primary. All traumatic inflammations are of this kind, all mechanical and chemical, and those produced by irritants locally applied. In proof that the tissues are specially affected in these may be cited the fact that the hyperæmia is precisely coterminous with the extent of the irritation. Thus a square blister will make a square patch of inflammation; a linear will make a linear; an annular an annular; and so on. If the hyperæmia depended on primary neuro-vasal paralysis this could hardly be; the hyperæmia would be diffuse, and would affect areas corresponding to the distribution of nerves and arterioles. In many instances, however, it is probable that the tissue disorder affects the capillaries solely or principally, and the arteries and their nerves but little. A cell lying close to a capillary may well affect it directly, and not through the intermedium of the nervous system. Certain limited inflammations, as those of psoriasis guttata, are probably caused in this way. The following instance affords evidence to the same effect: A patient had been painted with linim. iodi over the left subclavicular region, and the skin had become in consequence pretty smartly inflamed. To allay the irritation a poultice was ordered, but being maladroitly applied it only covered about two-thirds of the inflamed area. In two or three days the part which had been poulticed was nearly well, while the non-poulticed third was still much inflamed. Here the effect of a remedy in reducing inflammation was confined to the portion of tissue on which it acted, and left the adjacent uninfluenced. Another argument for the view that the tissue in many instances of inflammation takes the initiative may be drawn from the local action of certain drugs, which inflame particular parts and leave all others intact. It can hardly be anything except the special tissue of the part which determines this result, for nerves and vessels and connective tissue are the same everywhere, and presumably will be affected in the same way by the same agent. When arsenic, used for some remote skin disease, inflames the eyelids, and when the same agent administered for a conjunctivitis effects a cure, it is very difficult to explain this result, except by admitting that in the first case it has acted as an irritant to the tissue, and in the second, as a tonic to the nerves and vessels. Again, when an agent which has no tonic effect on nerves and vessels positively cures an existing inflammation, we are almost obliged to admit that it must have done this by exerting an influence over the tissue of the part which was primarily disordered. Thus, when potass. chloras cures a stomatitis, or veratrum viride a laryngitis, or antimony an inflammatory skin disease, we cannot believe that this has been accomplished by these drugs exerting a tonic action on nerves and vessels, for we never find them to possess such—rather the reverse. But it is quite conceivable that they may annul the morbid action going on in the inflamed tissue, may act as tissue sedatives, like moist warmth, or a poultice.

This, then, is one form of inflammation, but not the most frequent. More *commonly* we meet with conditions where the neuro-vasal paralysis seems to *be primary*, and to depend on the direct action of a poison on the nerves

and vessels. The tissue may also be affected, and often is ; but its derangement is more of a passive than active kind, and does not induce the hyperæmia. The capillary retentivity is much impaired, and fluids and corpuscles escape abundantly. When the effusion is abundant hyperæmia may not be apparent, and the disorder assumes the aspect of flux. Such inflammations may be termed *neural* to mark their relation to vaso-motor nerve paresis. They are often attended with very marked indications of general prostration.

The degree in which the tissue suffers in different inflammations varies very remarkably. We may take, on the one hand, as a typical instance, the inflammation of common decubitus. Here we first observe the skin to be red and tender in a circumscribed area, which, however, can be made pale by pressure. Soon the blood stagnates, and is perhaps extravasated in a central patch, the epidermis becomes detached, and the tissue dies. A sore results in which the same process is apt to continue. That the pressure is not the chief cause is evident, because such effects only ensue in conditions where the general vital power is gravely depressed, as by a low fever, diphtheria, phthisis, &c. Hyperæmia alone is, of course, insufficient. The stagnation of the blood, which some will designate capillary embolism, might appear an adequate cause did we not remember that quite the same changes often occur in purpura without any sloughing or ulceration, and, moreover, that stagnation is not a constant occurrence. No complete explanation of the local decay and death can be rendered : all that can be said is that the pressure acting as an irritant, or injuriously, on weakened vessels and tissue, has paralysed the one and killed the other. Contrast with this another typical instance—viz., the hepatised lung in acute sthenic pneumonia. Here the delicate membrane of the air-cells, $\frac{1}{200}$ inch in thickness, with its woof of capillary vessels, is imprisoned amid a massive exudation, which, by its mere pressure, might well have been expected to destroy the delicate fabric, and especially to have involved it in its own decay. Yet, as a writer on inflammation says, this massive cell-growth, after defervescence is over, "goes like snow in sunshine," and leaves the normal tissue none the worse. It is not, of course, denied that even in this instance the qualities of the tissue do not suffer some temporary impairment, as attested by the softening which in more asthenic states is often so marked. But, admitting this, there remains nevertheless a very striking contrast between the behaviour of the tissue in the two cases cited, and this shows what a very important part the vitality of the tissue plays in determining the results of inflammation.

Another typical instance for consideration is that of the common abscess, boil, or whitlow. Here also the tissue affection seems to be the leading phenomenon. When once the morbid action has fairly started it progresses almost invariably to suppuration and discharge of matter before recovery takes place. It seems as if the effective cause so deranged the nutrient process in the affected part, so perverted the normal tissue force, that until the abnormal energy thus evoked was spent in the organisation of a multitude of cells—pus corpuscles—the vasal nerves could not resume their sway over the arterioles and capillaries, and put an end to the hyperæmia and the effusion. In many instances of this kind the hypothesis of a poison to be eliminated by the pus may be entertained as the effective cause ; but in many also, especially those where the abscess is of traumatic origin, it seems that the derangement of the tissue is the direct result of the injury. The same cause may—acting in a similar way on the tissue—start that abnormal growth which we call cancer. A tendency to the occurrence of such suppurations prevails at times somewhat epidemically, and is regarded correctly as an evidence of depressed vitality. Certainly one may say that, *cæteris paribus*, the sounder is the constitution, and the stronger the vital force, the less tendency is there to suppuration from wounds or other provocation, and the converse is also true. The pyogenic diathesis is not, I believe, a state characterised by the presence of a pyoid material in the blood, but simply one in which the normal tissue force is unstable, and is easily deranged.

There is a great difference between these acute pyogenic inflammations and *similar but chronic processes* on mucous surfaces, which are often most

evidently controlled and put an end to by tonic remedies. The cause of this difference lies probably in the tissue being primarily affected in the first, and the vessels and nerves in the second.

The next variety of inflammation for notice may be the rheumatic, which is characterised by its shifting tendency and disinclination to form pus. By the first of these characters it shows an affinity to nerve disorders, as it does also by the great amount of pain with which it is attended—often quite out of proportion to the degree of inflammation existing. Its reluctance to suppurate testifies to the same effect, for this is a feature also of some inflammations which arise out of neuralgia. The replacement of articular rheumatism by active delirium, not depending on meningitis, is another evidence of the same kind, and so, I think, is the association of chorea with or its development out of rheumatism. The non-febrile forms of rheumatism pass quite gradually into typical neuralgias, and cases often occur where it is hard to say whether there is a rheumatic element in the neuralgia or not. Erythema nodosum is certainly a rheumatic inflammation, and if I attempted to define wherein this cutaneous disease differs from a common suppurating furuncle of the skin, I should say that in the first the vessels and nerves were chiefly at fault; in the latter, the tissue. It seems probable that a peculiar kind of neuro-vasal disorder has more to do with shaping the phenomena of rheumatism than the actual cause, or motor. For, as there is a scarlatinal, a gonorrhœal, a summer rheumatism (caused by heat), and a winter one (caused by cold and wet), it is evident that the cause may vary very much without the resulting phenomena being materially different. So it is with jaundice.

Gouty inflammation has much resemblance to rheumatic. Like the latter, it is fugitive, extremely painful, non-suppurating, and shows a decided tendency to alternate with nerve disorder. Gouty migraine, asthma, neuralgia, and mania are well known, and not rare occurrences. The dependence of gouty inflammation on a special toxæmia is a matter of tolerable certainty. According to this view I have long held that pain is a form of sensory paralysis, the first step in gouty inflammation appears to be the setting up of irritation of sensory nerves. This causes inhibitory or reflex paralysis of vaso-motor nerves, and consequent hyperæmia of the affected parts, attended with œdema, and followed by desquamation. The circumstance dwelt upon by Dr. Garrod, that even intense gouty inflammation, the part being as red as scarlet, "never leads to the formation of pus," is very instructive. It shows that neuro-vasal disorder is insufficient for the production of the graver results of inflammation; serous effusion indeed takes place, and necrosis of the outer layers of the epidermis; but the true tissue of the part is not involved in the morbid action until a local cause is added in the presence of chalky deposits from previous attacks.

In catarrhal inflammations, whether of cutaneous or mucous surfaces, the chief features are diffuse hyperæmia, with more or less copious escape of fluid and corpuscles from the blood, and detachment or malformation of the surface layer of the tissue. The exudation is sometimes wanting, as in dry eczema and dry catarrh, but, nevertheless, the nutrition of the cell-growth covering the surface, the epidermis, or epithelium, is deranged. The great majority of these disorders are characterised by general debility and vaso-motor nerve paresis; but there are certainly instances not altogether rare where this is not the case. Weak or languid heart, weak arteries, weak capillaries, weak tissues, might serve as a general formula; but in some instances one or other of the factors would have to be modified. Thus, we may have vigorous heart, or retentive capillaries, or stable tissues, in instances where all the other factors are weak. In eczema the tendency to implication of the tissue seems to be greatest in the "rimose" form of the disease, where hyperæmia is mostly by no means considerable. In some instances nothing can be more marked than the tendency to arterial paresis, and flushing of the capillary plexus with blood, often associated with leakage from the latter. The capillary power seems to be specially defective, more than the arterial, in the common impetigo of children, where much corpuscular *exudation* occurs in limited patches, but with little diffuse hyperæmia. In *many bronchial* catarrhs with thick muco-purulent secretion the same is prob-

ably the case. In all this class of instances the tissue seems but little implicated compared to the nerves and vessels, it rarely ulcerates or undergoes any permanent change. Detachment and casting off of its superficial cell-layer is all that mostly ensue. When the nerves and vessels regain their normal status, the tissue quickly returns *ad integrum*, and, for the most part, is not pigment-stained, as often occurs in psoriasis. This latter malady affords an interesting contrast with the preceding. The absence of exudation, the abrupt limitation of the hyperæmia and swelling, the gradual extension of the patches peripherally with their recovery in the centre, the frequent good state of health, are all points in which more or less the different character of the two is displayed. In the majority of cases eczema and its congeners are produced by some influence acting *ab externo*, probably by the unknown cause of catarrh, sometimes, however, by heat. Psoriasis, on the other hand, is produced by some in-bred poison, sometimes the gouty, which seems to irritate and derange the nutrition of the tissue rather than to cause direct paresis of vasal nerves. The annular or arcuate arrangement which the eruption of psoriasis often exhibits affords considerable evidence that the tissue is chiefly affected. It is almost impossible to conceive a paralysis of vasal nerves producing hyperæmia of the limited extent and peculiar form that is often seen in psoriasis. The absence of exudation also indicates that the tissue is affected rather than the vessels. For if these were at fault, exudation more or less would almost necessarily occur ; whereas the fact seems to be that a morbid attraction is exerted by the tissue on the contents of the capillaries, leaving the vessels themselves intact.

In erythematous inflammation the chief peculiarity is the slightness of any change beyond that of the distribution of blood. Accelerated necrosis and detachment of the epidermis occurs to a greater or less extent, but no apparent exudation or other morbid alteration. Between such inflammation as this and the destructive inflammation of decubitus or phagedæna the distance is immense. What makes the difference is not the degree of hyperæmia, but the state of vitality of the tissue.

The object of the foregoing remarks is to lay stress (1) on the primary concernment of the tissue in many instances of inflammation; (2) on the same being true of the vasal nerves in many others; (3) on the varying quality and results of inflammation, according as the affection of the tissue or nerves predominates.—*Medical Press and Circular*, *Aug.* 4, 1876, *p.* 83.

2.—INOCULABILITY OF SPECIFIC FEVERS.

By the Editor of the British Medical Journal.

Odessa having been subject, during the last three years, to frequent epidemics of typhus, typhoid, and relapsing fevers, Dr. Motschutkoffsky, physician to the City Hospital, has availed himself of the opportunity to study the question of the inoculability of these different forms of fever; being encouraged to undertake the investigation by a successful inoculation which Dr. Münch, the prosector to the hospital, made on himself with the blood of a patient suffering from relapsing fever. The experiments were made on persons who submitted to them voluntarily, and on animals (monkeys, rabbits, dogs, and cats). Inoculations from typhoid and typhus patients were frequently made, but never succeeded either in the human subject or in animals. On the other hand, relapsing fever is readily conveyed by inoculation to a healthy person. The inoculation on animals were without result.

As inoculable material, the blood alone was found suitable—repeated inoculations with milk, sweat, urine, saliva, and excrement, being resultless. The inoculation only succeeded when the blood was taken from a patient in the period of pyrexia, irrespective of which period it was. Inoculation with blood from patients who were free from fever during the stage of intermission gave negative *results. When the blood* was taken during a feverish attack, the inocula-

tions succeeded, whether spirilla could be seen under the microscope or not; they succeeded, for example, even in the first hours of an attack which was beginning. The relapsing fever thus artificially produced by inoculation differed in no respect from the relapsing fever acquired in the ordinary way—neither in the clinical appearances, nor in the strength, duration, or number of the attacks.

The blood of the inoculated disease was again inoculable ; but the theory of Davaine, regarding the increased potency of suppurative material when re-transmitted by inoculation, was not borne out. From inoculation with the blood of relapsing fever patients, relapsing fever was exclusively produced, and never any other form of infectious disease. Blood from patients suffering from the bilious type of relapsing fever produced the fever, but without the bilious type.

The period of incubation never lasted less than five nor more than eight days. The duration of the period of apyrexia was approximatively equal to the period of incubation. Inoculation with blood taken during the incubation period from a person inoculated was without result. The quantity of blood used in inoculating had no influence either on the duration of the incubation or on the intensity of the attacks. Blood taken from a person ten weeks after recovery from the last (fourth) attack did not produce relapsing fever. Blood kept for two days in a closed capillary tube at the temperature of 54 deg. Fahr. gave positive results: in this case the spirilla had not lost their capacity of movement. Inoculation with blood diluted with an equal part of 0·1 solution of quinine in water, acidulated with hydrochloric acid, succeeded completely: the spirilla lost their capacity of movement immediately after the mixture of the blood with the solution. Ten parts of blood diluted with one part alcohol at 60 deg. gave negative results after inoculation, the spirilla in this case also immediately becoming motionless when the fluids were mixed.

The results of Dr. Mutshutkoffsky's investigations are given in a short paper in the Centralblatt of March 11th, which we have translated almost literally. It is satisfactory to learn from the remarks with which the paper concludes, that none of the persons who were the subjects of experiment suffered from any permanent derangement of their health in consequence of the fever. The greater number of the experiments were made in the presence of the other members of the hospital staff. The author promises a further and full account of this remarkable investigation.—*British Medical Journal*, *March* 25, 1876, p. 383.

3.—DR. KLEIN'S REPORT ON THE CONTAGIUM OF ENTERIC FEVER.

In a report issued last year by the medical officer of the Privy Council, Dr. Klein pointed out that he had discovered the presence of peculiar bodies of the nature of minute vegetable organisms in the early stages of enteric fever. Since then, a principal object which Dr. Klein has held in view in his further studies of this subject has been to ascertain whether there is any special relation between these organisms and the progressive changes which take place in the intestine and diseased parts in this fever, similar to that which has already been shown to exist in the case of small-pox of sheep. This has involved much study of the microscopical anatomy of the mucous membrane and of the lymphatic follicles of the ileum, and incidentally a considerable amount of valuable information has thus been obtained as to the minute structure of the parts examined. In the sixth volume of the new series of Mr. Simon's reports, Dr. Klein's results are published in detail. They include an interesting account of former observations with regard to the minute anatomy of the organs most implicated in enteric fever, and of *the more recent* discoveries which Dr. Klein has himself made in this subject. *Not only* these, but also the more remarkable results to be referred to,

were, however, not obtained without considerable difficulty, because such microscopical examinations as it was essential to make in order to arrive at them, are all but impossible, unless the parts examined be dealt with almost immediately after death; and in most hospitals a regulation to the effect that *post mortem* examinations can only be made after a lapse of at least twelve hours from the time of death, has seriously interfered with these researches.

With regard to the principal object under investigation, it should be noted that the facts which have been put together by the most able and experienced pathologists tend to show that the contagion of enteric fever is due to a specific and living organism which, when transmitted from a diseased to a healthy individual, produces the same disease in the latter; and, further, that the chief, if not the only, vehicles of poison are the ejecta of the bowels of an infected person. Contagion in the form of a living organism could not be expected to produce infection at once; and the theory that it is organised is *primâ facie* justified by the circumstance that a period elapses between the reception of the contagium and the manifestation of the disease, during which the poison apparently lies dormant, but is in reality ripening towards an active condition. According to Dr. Klein, no other view of the poison affords any explanation of the incubation-period. But hitherto no one has succeeded in pointing out any specific organic form as the probable cause of enteric fever, and hence the paper which Dr. Klein has prepared is one of the highest interest.

Preliminary investigations were made with the stools of enteric fever patients, and the microscopical appearances which they present are described at length in Dr. Klein's paper. Amongst the objects noticed are numerous bright, highly refractive, spherical micrococci of varying size, both isolated and in chains or necklaces, and at times rod-like structures from which these micrococci could be traced to originate; but it is not in the evacuations alone that these bodies are found; they have been observed in abundance in the mucous membrane of the ileum in the stages of the disease preceding general ulceration. In those parts of the ileum which, at the commencement of enteric fever, appear to the unaided eye only to be slighty increased in thickness, Lieberkühn's crypts are seen to contain in their lumen, in smaller or larger masses, corpuscles of greenish yellow colour, highly refractive, varying in form and also in size from about twice the size of a human blood-corpuscle to that of a minute granule, and it is evident from the appearances which they at times present that they multiply by transverse division. From the characters which they present, Dr. Klein arrives at the conclusion that they must be of the nature of organisms, and with regard to them he further states that we have to do "with a fungus which possesses mycelium-threads of very unequal joints." In some parts of these threads, probably the terminal parts, "their contents split into macrogonidia or microgonidia," and the gonidia, when discharged, undergo rapid division, so as to form a kind of zoogloea. In short, a very definite conclusion is arrived at with regard to the identity of the contagium of enteric fever with a low vegetable organism.

The products of the fungus are also found in other parts of the mucous membrane. The gonidia form and the micrococci may be seen in the tissue of the mucous membrane close to Peyer's glands, and the micrococci especially occur in large masses in the lymph-spaces surrounding Lieberkühn's crypts and the tissue next to it. The spores and micrococci also find their way from the surface through the Lieberkühn's crypts into the lymphatics and blood-vessels. Both the organisms themselves and the various shapes and positions they assume are depicted in the clearest manner in the diagrams which accompany the report. Indeed, these beautiful illustrations from Dr. Klein's own pencil bring out the results of these investigations in a manner which must be most convincing to the eye of the anatomist and microscopist. One diagram shows how masses of these micrococci penetrate through the epithelium and accumulate in a space between it and the stroma of a villus; in another, the organisms are seen to penetrate from the free surface into the mouth of a Lieberkühn's crypt; they are also seen to make *their way into lymph-places* and into the walls of veins.

From these circumstances, Dr. Klein considers it clear that we have to do "with an absorption of masses of micrococci from the surface into the lymphatics and blood-vessels;" and he further shows that it is impossible that their presence can be due to *post mortem* changes. These organisms, too, are identical with those observed in the alvine discharges of enteric fever patients, and, as we observed in a preliminary notice of this report, the appearances presented by the organism "correspond closely with those described by Cohn as characteristic of the vegetation discovered by him in well-water in a district of Breslau famous for enteric fever."

Such results as these naturally give to this paper a special and distinctive interest; and, although, owing to the failure to communicate enteric fever to any of the lower animals, it has not yet been possible to perform, in relation to the supposed contagium of this disease, such crucial experiments as have been made with regard to some other diseases, yet a perusal of the facts recorded by Dr. Klein can leave but little doubt as to their reality, and, in the opinion of Mr. Simon, whose judgment in such a matter carries great weight, the interpretation which has been assigned to them seems to follow as an inevitable consequence.—*British Med. Journal, March* 25, 1876, p. 388.

4.—TYPHOID FEVER, AND THE FATAL EFFECTS OF DIGITALIS.

By Dr. William Murrell.

The treatment of the acute specific diseases by large doses of digitalis has for some years found favour on the continent, although it has as yet been but little used in this country. The drug, according to Wunderlich, is especially efficacious in the second or beginning of the third week of typhoid fever when the temperature is high and the pulse rapid. It is not claimed for the drug that it has any specific action upon the intestinal lesion, and it is said to be of the most value when danger is apprehended from the intensity of the fever. It is usually administered in the form of an infusion, or in substance, but hypodermic injections of digitaline are occasionally given. The quantity required to produce a decided effect upon the temperature and pulse is for an adult from 2 to 4 grammes (3ss to 3j.) of the powdered leaves, this dose being spread over four or five days. Large doses are, however, sometimes employed; Hirtz gives from 30 to 60, and Hankel from 47 to 62, and occasionally as much as 100 grains per diem. If the medicine be given irregularly, or if long intervals intervene between successive doses, the quantity is increased. Wunderlich finds that the temperature is slightly reduced on the first day, but that the pulse remains unaffected till the second or third day. The fall in temperature on the first two or three days is usually slight, but on the fourth or fifth day, when the full influence of the drug becomes manifest, there is often a reduction in the evening temperature of from 2 to 3 degrees. The temperature is seldom reduced to the normal, and never falls below it. On discontinuing the medicine the fall is at once arrested. When the temperature again rises after any considerable reduction has been made, it never reaches its former height. This second rise is often the forerunner of a definite improvement in the patient's general condition. The influence of the drug upon the pulse is most marked on the fourth or fifth day from the commencement of the treatment, there being often a fall of from 30 to 60 beats in the twenty-four hours. The pulse often falls below the normal, and this effect occasionally persists for some weeks after the termination of the illness. The change in the pulse-rate is coincident with the fall in the temperature. Wunderlich's conclusions have recently been confirmed by Bernheim, who, however, differs from him on a few comparatively unimportant points. Thus he found, that although the pulse and temperature do not fall uniformly, yet the pulse rarely commences *falling* before the temperature, or the temperature before the pulse. He also states that it is the rule for the pulse to fall below the normal

These views have not, however, received universal acceptance even on the continent. Thus M. Desnos, of the Hôpital de la Pitié in Paris, found digitalis of little or no use in reducing the temperature in enteric fever or for otherwise modifying the course of the disease. He attributes its supposed success in other hands to a therapeutical illusion, and thinks that sufficient attention has not been paid to the natural course of the disease.

In January, 1874, the digitalis treatment was adopted at University College Hospital in a case of typhoid fever; the patient was in the children's ward, under the care of Dr. Ringer, by whose permission these notes are published. The progress of the case serves to illustrate the influence of the drug upon the pulse, and its fatal termination demonstrates the existence of a danger which has apparently been completely ignored by continental observers. The patient (F. F.), a bright, intelligent-looking girl aged ten, had been an inmate of an Orphan Asylum in the suburbs. From the statement of the matron, it appeared that some six or eight weeks previously a child suffering from typhoid fever had been admitted to the Home, and for a few days, before the nature of the illness was recognized, had been allowed to associate with the other children. In about a month, some sixteen or eighteen of the inmates were attacked with the fever, the majority being subsequently distributed among the metropolitan hospitals, a few only being treated privately. It was impossible under the circumstances to obtain any definite information respecting the onset of the illness; but the patient was stated to have been ill six days.

When first seen (January 2nd, at 7.0 p.m.) patient was lying on her back in bed, her countenance wearing a marked expression of illness. The face was not flushed, but there was a dark rim beneath the eyes; she was quite sensible, and answered quietly and rational. On being questioned, she said she had a headache, but did not complain of it spontaneously; she had also pain in the right iliac region, but there was not much tenderness, and no gurgling was felt; there was no rash observable on the thorax, back, or limbs; the spleen was slightly enlarged; there was no lung or heart complication; temperature (rectum) 104, pulse 130, quick (*i.e.*, of short duration), easily compressible; skin moist; tongue moist and covered with white fur, except at the tip and edges; urine high-coloured; sp. gr. 1029; free from albumen; bowels confined; no coryza; no sore throat.

Although not a typical case of enteric fever, no doubt was entertained respecting the diagnosis. On January 4th (eighth day), at 7.0 a.m., patient commenced taking pulv. digitalis gr. j. every two hours. That night there was no evening exacerbation of temperature, which was a degree lower than at the same hour on the previous night. The evening pulse was 116, as compared with 132 of the night before. The bowels were opened once, the motion being formed and of a dark brown colour. On the following evening a further fall of 16 beats in the pulse was noted, and a reduction of 6-10ths of a degree in the temperature. The patient usually took about 8 grains of the digitalis in the twenty-four hours, the rule being not to give it at night if she were asleep. On the 6th there was a further fall of a degree in the 11.0 p.m. temperature. The pulse continued strong and regular. The bowels were again opened. On the 7th, patient heaved very much after taking the powders, but managed to retain them. There was no further reduction in the pulse, but the 11.0 p.m. temperature showed a fall of another degree. On the 8th, patient vomited twice immediately after taking the medicine, and an equivalent dose (9 ♏) of the tincture of digitalis was accordingly substituted. There was during the day no further fall in the temperature or pulse. Patient had two motions, not formed, of a yellowish-brown colour, highly offensive odour, and alkaline reaction. From this time the bowels were opened daily, the motion being usually of the character just described. On the morning of the 9th (and the thirteenth day of illness), two spots—rose-coloured approaching brown, about the size of a pin's head, slightly elevated above the surface, disappearing on pressure—were seen in the right lumbar region, and one just above the level of the first true rib. At 11.0 a.m., the pulse was 66, sharp, not compressible, and for the first time regular. *The irregularity* consisted of the intervention of three or four

semipulsations between every third or fourth beat. The pulse at 7.0 p.m. was 70, and at 11.0 p.m. 64, showing a fall of 68 beats in six days of the digitalis treatment. The respiration had also been reduced from 32 to 20. At 11.0 p.m. the pulse was 64, there having been a fall of 44 beats in twenty-four hours. On the 10th the pulse varied from 56 to 60, was full and sharp, and the irregularity had disappeared; respiration 16; there was a further eruption of typhoid spots, and an increased elevation of temperature; a trace of albumen was observed in the urine. On the 11th patient was ordered brandy, 2 ozs., the digitalis to be continued as before. On the 12th, at 11.0 p.m., the pulse was 52 and respiration 32. There was a copious eruption of sudamina on the abdomen and front of the thorax. In the afternoon the temperature rose to 103·8; the patient was rolled over on her side, and her back was examined; there were no bed-sores, and only a few typhoid spots; there was no obliteration of the breath sounds, no râles, and no dulness at bases; there was no cardiac mischief; the pulse varied from 52 to 60, being at night quick, irregular, and compressible. On the 14th, patient was very restless, and complained greatly of thirst; there was a farther elevation of temperature, which at 11.0 p.m. was 104·4, the pulse being 72, slow, slightly irregular and not compressible. At 3.0 p.m., in consequence of the rise of temperature, an addition of 3ɱ was ordered to the tincture of digitalis, but by mistake the medicine contained only 3ɱ, and of this patient took three doses, at five, seven, and nine o'clock. The error was then rectified, and at 11 p.m. patient commenced taking the full 12ɱ dose. On the 15th there was a slightly increased elevation of temperature, and the pulse, taken five times during the day, was 70, 106, 80, 68, and 90; it was fairly strong, irregular, but not intermittent. Patient was extremely restless during the night, and passed urine and fæces in bed. She was seen at 11.0 a.m., when the temperature was 104, the pulse fairly strong, but intermittent; half an hour later attention was drawn to the patient by a slight gurgling noise; the pupils were widely dilated; the pulse was extremely weak and could be felt with difficulty at the radials; in three or four minutes the patient was dead. There were no convulsions; the temperature in the rectum immediately after death was 104. An autopsy was made thirty-six hours after death. In the lower third of the small intestine, Peyer's glands were inflamed, and marked at intervals with small ulcers, varying in size from a pin's head to a split pea. In places the ulceration had exposed the transverse muscular fibres of the intestine. There were no signs of perforation; lungs and heart were normal.

Practically what we learn from the case is this: that although by means of digitalis we may rescue a patient from the deleterious influence of an excessive rise of temperature, yet that its use is not unattended with danger, and that during its exhibition death may occur suddenly and unexpectedly, and without a single note of warning.—*Practitioner*, *Nov.* 1875, *p.* 345.

5.—THE USE OF SACCHARATED LIME IN TYPHUS FEVER AND OTHER COMPLAINTS.

By Professor CLELAND, F.R.S., Galway.

[Professor Cleland considers that there is an utter misconception of the properties of saccharated lime, but in this paper he refers especially to its use in fevers.]

The two points most necessary to insist on in the administration of this remedy are probably large doses and copious dilution. A teaspoonful of the pharmacopœial "liquor," given after meals, is necessary, in most cases, to develope its effect as a stomachic, and should be diluted in three or four ounces of water; but in cases in which there is foulness of the tongue from acute causes, much the best plan is to fill a tumbler with water, introduce as *much of the solution* of lime as can be added without giving a very disagreeable taste, and let the patient drink of the mixture ad libitum; and when

one tumbler is finished let another be filled. Generally, I believe, in most cases in which there is great foulness of the tongue, this treatment will be found most advantageous. It is not suitable, however, where there is inflammation of the stomach, or great irritability indicated, for example, by central redness of the tongue, with sharp ragged edges. Attacks of bilious or gouty diarrhœa and British cholera yield with great rapidity to the free use of saccharated lime, and it is found exceedingly grateful by the patient on account of its alleviating the dry uncomfortable feeling in his mouth. It produces usually copious diuresis, a gentle perspiration, and relief from tormina, while the violence of the action of the bowels is quickly mitigated. There is never, however, the slightest constipation produced, the action of saccharated lime being slightly aperient, and even in some persons markedly so.

In fever, I do not claim any specific virtue for this remedy. Its action is in great part intelligible, and requires merely to be mentioned, I imagine, to commend itself to the profession as being highly advantageous. In many instances I have had occasion to observe that when an hospital patient had a black, parched, and cracked tongue, like a cinder, with the teeth and lips black with sordes, saccharated lime being administered freely, the tongue was moist the following day, and in a few days the crust had entirely loosened and disappeared. The cases to which I allude have all been cases of typhus, no typhoid cases having come into the Galway Fever Hospital during the past year, nor for some time previously. In these circumstances, although I have tried saccharated lime in typhoid fever, I am not prepared to make any statement with reference to its utility in that particular disease; but in any case of black parched tongue, no matter what the disease, I should rely on its effects. It is even beneficial where that symptom exists from urinary causes. In typhus it has become my habit to give the lime in milk instead of water. Given in this way it has the advantage of preventing that peculiar sensation in the mouth which is liable to follow the drinking of milk, and make it unsuitable for quenching thirst. Thus the patient is induced to take a certain amount of mild nutriment when he is most prostrate. It can scarcely be doubted that to this circumstance, as well as to the improvement in the whole length of the alimentary canal, indicated by the effect on the tongue, the benefits which I have observed to follow the free use of saccharated lime are to be imputed. I do not pretend to see a large number of cases; but those which I have seen have been sufficient to justify these remarks. Within the last year, of sixteen females admitted to hospital, suffering from typhus, and treated by me, only one died; and that one case is rather an example of the efficacy of the remedy of which I speak, than the reverse; for she was an aged woman with her tongue parched and blackened to a cinder, and within a few days of the fever running its course when she was admitted; yet she speedily revived, and when at last she succumbed, after several weeks, it was under the effects of exceedingly extensive bed sores, which had commenced before her admission, and affected the pubis, nates, and both hips. In no case do I impute to the saccharated lime effects which might rather be considered due to stimulants; for, though convinced of the necessity of the latter in moderation, in hospital cases I have probably never ordered more than six ounces of wine, and four ounces of spirits *per diem*, and very rarely so much.—*Practitioner*, *Dec.* 1875, *p.* 401.

6.—ON FEVER.

By Dr. J. Burdon Sanderson, LL.D., F.R.S.

The general conclusion to be derived from a whole series of cases is that in the early stage of fever a patient excretes about three times as much urea as he would do on the same diet if he were in health, the difference between the fevered *and the healthy* body consisting chiefly in this, that whereas the

former discharges a quantity of nitrogen equal to that taken in, the latter wastes the store of nitrogen contained in its own juices. That this disorder of nutrition is an essential constituent of the febrile process is indicated by the fact that it not only accompanies the other phenomena of fever during their whole course, but precedes the earliest symptoms and follows the latest. That it anticipates the beginning of fever was first demonstrated by Dr. Sidney Ringer in his investigation of the relation between temperature and the discharge of urea in ague. That the same condition continues after the crisis has passed, *i.e.*, the temperature has begun to sink, was shown by Dr. Squarey in his investigation of eighteen cases of typhus, in all of which the daily excretion of urea was measured, and the variations of temperature were observed during the whole course of the disease, and the observations were continued until convalescence was completely established. In these cases it was found that, whereas the bodily temperature which in this disease rises rapidly at the beginning, and keeps up without sensible abatement during a period which often extends to the middle of the second week, usually begins to fall after the tenth day, the daily rate of discharge of urea, although usually above the normal during the first week, did not attain its maximum until the temperature had been falling for some days.

The question of the source from which the urea increment of fever comes is one which can be better discussed subsequently. At present it is sufficient to notice that the anticipation of the obvious symptoms of illness, particularly of the pyrexia, by the increased excretion of urea, as well as the continuance of the urea excess during the epicritical period, plainly indicate that pyrexia is not the agent by the direct influence of which the increased secretion of urea is produced.

Another consideration suggested by the same facts is this, that the mere increase of the percentage of urea discharged affords an adequate measure of the waste of nitrogen, *i.e.*, of albumen, which actually occurs in fever; for to form a just estimate, the ovelapping at both ends of the process ought clearly to be taken into account. Moreover, in fever there are very frequently losses of nitrogen by the bowels and skin, as well as by exudation, the amount of which scarcely admits of being determined.

It having been established that there is an increased discharge of nitrogen in fever, it remains to state what is known as to its source. There are two sources which are open to discussion, viz.: (1) the albumen of blood and lymph, and (2) that of the tissues; or, to use the expression which the researches of Voit have rendered current in physiology, store albumen, and tissue albumen. By the former we understand the albuminous constituents of the corpuscles and plasma as well as of the tissue juice or lymph; by the latter, the material of protoplasm, including that of the blood corpuscles.

Here the basis of observation is furnished by researches made by Dr. Salkowski, relating to the proportion of potassium salts discharged by the urine in fever, as compared with that of sodium salts. These researches relate to some twenty cases of various forms of febrile disease in Professor Leyden's wards at Königsberg. The research began with an investigation of the relative proportion of potassium and sodium salts discharged by the liquid and solid excreta in health, the observer being himself the subject of observation. The diet being mixed, and the nutritive condition nearly that of nitrogen equilibrium as seen by the constancy of the daily discharge of urea (min. 25·3, max. 27·2, mean of seven days 25·69), the daily quantity of potassium and sodium salts respectively, reckoned as potash and soda were: potash, 3·094 grammes; soda, 4·207 grammes; so that of the sum of both alkalies potash constituted 41·4 per cent.

In another individual, a clerk, on low diet without meat, affected with syphilis but in good general health, the soda discharge was about the same, but that of the potash much less, so that the potash percentage varied from 18 to 26. From these and other observations it was concluded that the daily potash discharge of a healthy person on fever diet is less than one gramme.

The febrile cases investigated were one of relapsing fever, one of erysipelas, *and several of* pneumonia. In the case of relapsing fever, which was ob*served during* part of the first paroxysm, the whole of the first remission,

and of the first relapse and second remission, it was most distinctly seen, that whereas during the remission the potash percentage of the total discharge of both alkalies sank to about 18·20, it rose during and especially after each crisis to about 90. In the case of erysipelas and in the pneumonia cases there was a corresponding relative and absolute increase of the potash discharge. There were, however, peculiarities in all the cases, which have been fully described by the authors, and are of sufficient importance to require notice.

On the whole the absolute quantity of potassium discharged on febrile days is three or four times as great as on non-febrile. As regards soda the results are entirely different. During fever it is seen in most of the tables that the soda discharge is extremely low. As soon as the crisis is passed it at once begins to increase to such an extent that in one day as much soda is eliminated as on all the previous days taken together. Simultaneously the percentage of potash discharge falls to its lowest.

The augmentation of potash discharge in fever, when little or no meat is being taken, and its rapid decline in defervescence, shows that the augmented production of urea in fever must take place at the expense of some source of albumen which contains potash. We have, therefore, in this fact an answer to the question from which we started. The albumen which serves as a source of urea in fever is not derived from liquor sanguinis (for the liquor sanguinis abounds in sodium salts, but contains very little potassium), but either from the blood corpuscles or from muscle, or both.

The very remarkable diminution of the discharge of sodium signifies of course that in fever, the common salt, which constitutes the bulk of the salts of the blood, is retained; for immediately after the crisis (as shown most distinctly in three of the cases), it passed into the urine in great abundance.

In addition to increased excretion of potash there is another circumstance which points to the blood corpuscles or to the muscular tissue as the chief seat of disintegration in fever, namely, the increased discharge of colouring matter. Unfortunately as regards this most important question sufficient information is wanting. There are, to the best of my knowledge, no comparative determinations either of the proportion of blood corpuscles or (what would be as useful) of the iron per-centage of the blood before and after acute fever, either in man or in the lower animals. The only facts relating to the subjects that I know of are (1), that in all febrile diseases the colouring matter of the urine, which is probably derived ultimately from the blood hæmoglobin, is three or four times as abundant as in health (*see* Neubauer and Vogel); and (2) that after traumatic fever in dogs there is a very marked diminution, both of the corpuscles and of the iron of the blood. But these observations are quite inadequate to serve as a basis for an opinion as to the proportion which the breaking-down of blood-corpuscles bears to the total disintegration of fever. Of the many questions which require answering, there is perhaps none which is of greater importance, for if, as appears probable, the destruction of the coloured corpuscles is a part of the febrile process, the fact must have a very important bearing, not merely on the process itself, but on its after results. The colouring matter of the blood being the means by which oxygen is distributed to the tissues, the destruction of it must impair every function of organic life.

As regards the exhalation of carbonic acid in fever, the existing knowledge is much more unsatisfactory than that which relates to the disengagement of nitrogen. Indeed, the only observations on the subject are those of Prof. Leyden.

We are now in a position to take a general view of the febrile process, so far as relates to the exchange of material and the disintegration of tissue. We have seen that it is established on grounds which do not admit of any question, that a fevered man or animal discharges more nitrogen than a healthy person or animal on the same nitrogen income; and, that as regards man, the febrile excess amounts to something like three quarters of the normal expenditure. We have also seen that in man there is during fever an excess of discharge of carbonic acid, and that this cannot be accounted for as the mere

result of excessive respiration, but that no such excess is observed in the dog. We have now to bring these facts into relation with each other.

In health, the whole of the nitrogen discharge is derived from food. In inanition, when nitrogen income vanishes, all the nitrogen which passes out as urea or otherwise is derived from stored or tissue albumen. In fever this is also the case, for the nitrogen income is as defective in the one condition as in the other; but besides the using up of stored albumen, there is an additional and altogether abnormal disintegration which, for reasons already stated, we believe to take place at the expense of blood corpuscles, of muscle or other tissue. That fact must be taken as a starting point in any attempt to understand the febrile process as a disorder of nutrition.

A healthy adult on ordinary mixed diet discharges from 30 to 36 grammes of urea daily; a healthy adult, on fever diet, discharges from 15 to 20 grammes; but if he is fevered he discharges, on the same diet, a little more than on ordinary diet in health, say from 35 to 40 grammes. A normal person on fever diet discharges about 22 grammes in an hour, of carbonic acid, in health; about 32·3 grammes in fever. Where does this come from?—To account for the urea excess, one must suppose (the nitrogen equivalent of one gramme of urea being 3 grammes of albumen) that 60 grammes of albumen are disintegrated in 24 hours. These 60 grammes would (the carbon percentage of albumen being 53) contain 31·8 grammes of carbon, of which one-fifth of the weight of urea discharge (the proportion of carbon in any given weight of urea being $\frac{12}{60} = \frac{1}{5}$), *i.e.*, four grammes, would pass out as urea. The remainder, viz., 27·8 grammes of carbon correspond to 102 grammes of carbonic acid, which would therefore express the increase of carbonic acid discharge which would result, supposing that all the carbon of the tissue disintegrated to form the febrile excess of urea left the body in that form. 102 grammes per day is only 4¼ grammes per hour; consequently the quantity of carbonic acid produced by the disintegration of albumen in fever is a mere fraction of the total quantity exhaled (32.3 grammes). We have therefore a remainder of 28 grammes which must be derived from the consumption in the body of material not containing nitrogen.—*Practitioner*, *April*, 1876, *p.* 272.

7.—COLD WATER IN FEVER.

By Dr. C. Binz, Professor at the University of Bonn.

It is not long since every fever patient was carefully guarded from pure air and fresh water. Thick blankets and hot beverages seemed indispensable. Several medical men observed that this treatment did more harm than good; but James Currie was the first to have any success in fighting against these prejudices.

Old and deeply-rooted errors do not fall at one blow, especially when they derive support from the extravagances of the opposition. So at least it was with us. Priessnitz, and the fanatic hydrotherapeutists who followed him, barred the way for a long time to the rational use of cool water; and it is only about fifteen years ago that we recurred to the healthy principles of Currie.

The matter itself is very simple. If a patient at 40° C. (104 F.) is placed in a bath at a lower temperature, he must quickly part with heat. In fever the natural regulation of heat which keeps our body at an almost equal temperature is insufficient. The cool bath makes up for this. If we measure the temperature after the bath, we shall find it lower than before. The blood that surrounds the cells of our nerve centres is less hot. The patient therefore feels stronger and quieter.

Cold baths (15–20° C. — 60–68 F.) have the clearest effect. Extensive experience has taught that their action is most positive when they are short and *often repeated*. Very weak patients must begin with 35° (97 F.), and then

the warmth must be lowered to 20° (68 F.), by carefully and gradually adding cold water. In the meantime the body should be gently rubbed.

Cold sheets (Kalte Einwicklungen) are less efficacious and cold affusions (Uebergiessungen) have less effect; this latter considered merely from the antipyretic point of view.

Only a high degree of weakness of the heart, loss of blood, or perforation of the bowels, are contra-indications against the use of cool baths. Menstruation is not one when the fever is at a dangerous height, and pregnancy never. Every age and every constitution permits the withdrawal of fever heat, only it must be observed that the loss of heat is in inverse proportion to the weight of the body. For babies we need therefore seldom go under 30° C. (86° F.) to have a full effect; the temperature of the water must be lowest for strong adults.

External application of cold proves, like all other febrifuges, to be most efficacious when the temperature has a tendency to sink spontaneously. That is from seven in the evening till morning, and again in the day from eleven till two o'clock.

The after-effect is of great importance. Under some circumstances it lasts several hours, that is, the lower temperature continues even when the patient has been removed from the water. The reason is probably as follows :—

In fever the vessels of the skin are generally much contracted. The cool water acts as a strong stimulant on them, and causes a somewhat stronger contraction to take place, but this is only of short duration. Relaxation for a longer term is the necessary consequence. The hitherto bloodless and dry skin becomes filled and moist, and thus the irradiation of warmth goes on. It is easy to convince oneself of this state of the skin after the bath. The cooler the bath and the longer it lasts, the more evident and the more lasting will be its result.—*Practitioner, April*, 1876, *p.* 282.

8.—PERNICIOUS FEVER: FEBRIS ALGIDA AND FEBRIS COMATOSA.

By Dr. JOHN SULLIVAN, Havana, Cuba.

It may easily be imagined that the poison of malaria, in proportion to the degree of its intensity or destructive power to the susceptibility or the bodily condition of the recipient of such poison, may generate a fever, which from its tendency to paralyse all nerve-power, and to promote a dissolution of the elements of the blood, may justly be denominated "pernicious fever."

No poison has ever introduced itself into the human system so capable of producing effects so varied, of assuming such questionable shapes, of wearing so many masks and disguises, as the poison of marsh-fever,—effects which vary in degree from a slight depression of nerve-power to a partial extinction of sense, and even to the complete destruction of life. But the poison of malaria will often lay concealed in the system like a coiled-up serpent, ready at any moment to dart its venom to complicate and exaggerate any disease to which the body may be subject, if it do not completely control and subject such body to its undivided influence; or it will take upon it so many Protean forms that its victim will be thrown off his guard, and probably die from its masked effects. But under no form does malaria show itself with so great intensity as under the form of pernicious fever. This fever may appear under the form of algid or of comatose fever, with all their varied complications—febris algida being the most complete expression of the true nature of the poison, paralysing all nerve power, determining the blood to internal organs, and thus producing that intense algidity as of death; while febris comatosa is marked by an especial malarious determination to the brain, producing an anæmic contraction of arteries as in a fit of epilepsy.

It sometimes happens, while attending upon a case of intermittent fever,

when we imagine that the case is progressing satisfactorily and with all due regularity, on a sudden we observe the symptoms to alter greatly for the worse: one or more of its stages may become present in great intensity, complicating or placing in jeopardy one or more of the organs essential to life. In the tropics, pernicious fever may be seen in all its most formidable array, complicating the various types of intermittent, and tending to aggravate a variety of morbid states which have no necessary connexion with the poison of malaria. The prognosis must depend upon several conditions. Suppression of urine is an alarming symptom, but should the secretion be restored, an improvement is sure to follow. Convulsions, frequent in children, are, perhaps, next to black vomit, the most dangerous symptom; when they make their appearance at the close of an attack of fever, there is always danger to life. Vomiting of black matter is fatal to adults; I have seen children occasionally recover.

There are two symptoms which, when they do occur in the course of an intermittent, always occasion me great alarm and anxiety. The one is an acute pain which fixes itself in some part of the body—sometimes in the side, like an attack of pleurisy, at others it strikes upon the hip-joint. Now, from long experience I have always found the accession of these pains to be a very ominous symptom. The second symptom, of still rarer occurrence, is the vomiting of blue (not black) matter; it may occur in the adult who has suffered from marsh cachexia, or from chronic diarrhœa.

Pernicious fever, the reverse of yellow fever, may repeat itself. I have known persons whose life was always a burden to them from the fear of a fresh attack. All races suffer from it. Old people often die from it. I have seen children attacked by it two or three times almost imperceptibly, then begin to vomit up a blackish fluid, followed by convulsions and death.

In children, when fever is ushered in by general or partial convulsions, the symptom is generally fatal, as indicating a tendency to the same manifestation in every succeeding attack.

All chronic diseases in tropical climates, all deep-seated causes of debility, privation, and suffering, the emotions from grief or anxiety, alcoholism, predispose to attacks of pernicious fever, since malaria directly attacks nerve-power, and when this has been shattered from the above causes, it becomes more sensitive to its influence. The varieties of pernicious fever characterised by some violent predominant symptom may be classed into two principal groups—febris algida, comprising the fainting, dysenteric and choleraic varieties; febris comatosa, the tetanic, lethargic and convulsive.

Algid Pernicious Fever.—Febris algida would appear to be the most faithful manifestation of the *modus operandi* of the poison of malaria on the living organism—perhaps the only pathological base upon which all other pernicious fevers rest, so that it will sometimes appear in its naked uncomplicated form as a termination of pernicious fever.

The progress of algidity is usually insidious; it often shows itself in the middle of an apparently simple attack of intermittent. The patient appears in his usual health; presently the face turns pale, the features become sharpened and drawn in, the lips turn blue, the eyes hollow, the pupils become dilated, the pallor and coldness gradually go on increasing, and cold, clammy sweats pervade the entire body; you might fancy you were gazing on a corpse. The hands and feet first turn cold, next the extremities; the abdomen alone preserves some heat. If you touch the skin it feels like marble, and yet the patient complains of a sensation of heat internally. The tongue is the last to become cold, and when the air expired is colder than that inspired, the danger becomes imminent. The urine is often suppressed as the algidity increases; the skin becomes more and more bathed in a cold perspiration. The heart beats slowly and is scarcely audible; the pulse thready, not to be felt at the wrist. The intellect is unimpaired. The patient does not complain of any particular pain. Respiration, from being calm and slow, becomes anxious and rapid. To a calm succeeds a vague sense of uneasiness, which is soon replaced by a feeling of approaching death.

The most remarkable case of algid pernicious fever that I ever witnessed *was the following,* which I will now relate. In the present year (April,

1875), I was called to visit the wife of D. B. M., a well-known sugar-planter in Cuba. She had been delivered of a child about two months before, at which time she complained of slight chills and fever; since then severe intermittent had set in. I was greatly surprised on my arrival at the consternation and dismay depicted on the countenances of the patient's friends and attendants. I decided upon taking a view of the patient unseen by her. She was seated in an arm-chair, the arms of which she firmly grasped with both hands; the body slightly inclined forwards, rigid, erect; the face was pale and cadaverous, the countenance expressive of anxiety and terror, mixed with a certain degree of sadness. She looked as it were on vacancy, and took no notice of those who surrounded her. On my entering the patient's room she directed an anxious and enquiring look towards me, as if conscious who I was, and desirous to be relieved. I took her hand, which, as well as the entire body, was bathed in a cold, clammy, icy sweat; no pulse at wrist. She could only reply to my questions in a whisper, but a whisper deep, cold, and unearthly. The heart's beat was strong and even tumultuous, as though labouring hard to upheave and dislodge the mass of blood by which it was oppressed. The right heart communicated its impulse to the jugular veins, —hence strong venous pulsation.

I found, on examination, considerable congestion and enlargement of the spleen, and induration of an atrophied liver. I ordered a hot mustard foot-bath, ten grains of calomel with fifteen grains of quinine, to be taken immediately,—the dose to be repeated in two hours' time; frictions of quinine in brandy (two to six drachms) to be rubbed over the extremities and down the spine every half-hour. About four hours after my first visit the heat of the body returned, and the patient was enabled to lie down in her bed, which she had not been able to do during the last three weeks. After the second dose, I followed up the calomel and quinine in smaller proportions—two grains of calomel to four of quinine every four hours. I ordered besides, in order to promote the partially suspended secretion of urine, two tablespoonfuls of a strong diuretic mixture every two hours, and placed over the loins (a custom peculiar to the country people) some digitalis leaves wetted with vinegar. After eight hours had elapsed, considerable relief was obtained and all the symptoms improved; the secretion of urine was restored, circulation became less impeded, and some sleep was procured. The algidity returned daily about 3 p.m. for three successive days, but in a gradually milder form, of less duration; and the patient finally completely recovered. This case I regard as very instructive and interesting, as it is a complete manifestation of the effect of malaria upon the human body. It would seem that the miasmatic poison availed itself of the new inlet into the system by the medium of the raw and diluted surface of the vagina and uterus after delivery—a medium through which, under similar circumstances, other septic poisons have been introduced, and with fatal effect, into the system. This intensified dose of malaria would appear to have generated algid pernicious fever. Large doses of quinine in this case proved most triumphantly its value and its nature as an antiseptic.

The diagnosis is easy when the pernicious fever is simple, but when complicated with dysentery or cholera it is rather obscure. Between pernicious choleraic fever and Asiatic cholera it is almost impossible to diagnose, especially when the two endemics exist at one and the same time. But between simple dysentery and pernicious dysenteric fever the diagnosis is more easy. The stools are not so bloody; they are more abundant and liquid, and provoke less tenesmus. The antecedents—attacks of fever, algidity, and cold sweats, &c.—make the diagnosis more easy. We must not confound the fever of pernicious dysenteric fever with that which accompanies simple or true dysentery, which is symptomatic; while the fever of pernicious dysenteric fever, being of malarious origin, is independent—a foreign element superadded to the principal malady, which it aggravates and often renders mortal. This is an important fact, worthy to be remembered in our practice in tropical climates. Hence, in the complicated dysentery, all remedies directed to the cure of dysentery will prove useless, so long as we do not neutralise the foreign *morbid element by large* doses of an antiseptic.

The attack of febris algida consists of one long stage. The cold increases gradually, with cold and clammy sweats; the voice falls to a whisper; the pulse falters, finally ceases; and the patient dies in swoon. Should reaction take place, the pulse rallies; the heat returns gradually to the surface from the abdomen, in which it would appear to have concentrated itself, radiates to the chest, and thence to the whole body. The cold stage, or state of algidity, may last forty-eight hours or longer. Recovery is often insidious, and may be complicated with symptoms of an ataxic or typhoid nature. The mortality from febris algida is not so great as that from febris comatosa. In the algid state the powers of absorption do not appear to be annihilated, as in the cold access of Asiatic cholera.

Comatose Pernicious Fever.—Insolation is occasionally a most powerful cause. A man who leaves a marshy district, and who travels a long way exposed to a burning sun, is very subject to an attack of malarious apoplexy. The fit may seize him in the evening when the sun has set, or even at nighttime when in bed. Like other pernicious fevers, the comatose form especially attacks those who, after a long residence in a marshy district, remove into another free from malaria.

The comatose form is usually preceded by some derangement of the health —by two or three irregular attacks of fever, which may be trivial or scarcely perceptible.

The invasion of coma is violent, its progress rapid, its stages of intense severity; if the patient be seized when standing, he falls down as if struck by lightning; if when lying down, it comes on unperceived, and only to be revealed by his stertorous breathing.

I have never known delirium or convulsions precede an attack of pernicious malarious coma. I remember one patient, who had recovered, told me that he had experienced during two or three days before the attack a creeping sensation up the back, with a sense of suffocation and constriction about the chest. The cold feeling is absent, but the hot stage is soon developed; and unlike the skin in febris algida, it is covered with a hot perspiration—a frank intermittent is seldom observed. The fit may last from four to five hours, or even to as many days. The characteristic symptoms are: loss of motion, sensation, and intelligence, with impaired functions of respiration and circulation; the patient answers pettishly and in monosyllables; the pupils are insensible to light; some low murmurs of complaint may be often heard, indicating severe headache. The frequent return of motion proves the intermittent character, when the symptoms generally improve. But in cases which threaten to end fatally, we often observe muscular contractions, as trismus, strabismus (complete abolition of sense and motion). There may be violent tonic and clonic contractions; and death often closes the scene, after one or two attacks of black vomit.

The diagnosis is not difficult. The antecedents—previous attacks of intermittent, the paludinous diathesis—the absence of all plethoric symptoms, will clear the way for a correct diagnosis. The only difficulty is to diagnose between the apoplectic form of pernicious fever and true apoplexy. This occurs but very rarely in the tropics, but may occur to strangers who have lately arrived. We must be careful not to bleed in pernicious apoplexy, as distinct from true apoplexy. Bleeding would inevitably hasten the fatal termination. By not interfering too hastily, by waiting a little, by adopting the maxim *festina lente*, so as to allow the disease to clear up, we may be enabled to form a just diagnosis. The heat and moisture of the skin, the hurried pulse, indicate that the apoplectic fit derives its origin from marsh poison. Post-mortem examination reveals no inflammation of the brain or of its membranes, nor any lesion to which might be traced the severity of the symptoms. We may find, as in all fevers of a certain duration, the membranes, especially the pia mater, somewhat injected; the cerebral substance redder than usual; some serum infused into the ventricles; and when black vomit has occurred, we shall find the mucous membrane of the stomach of a *yellowish tint*, streaked with violet-coloured stains.

The almost impossibility of administering proper medicines adds to the *danger of this form* of pernicious fever. Quinine can be introduced into the

stomach with difficulty, by reason of the spasm of the pharynx or œsophagus. We must, therefore, have recourse to injections of the drug per rectum, to frictions of quinine in alcoholic solution so as to produce absorption. In these cases the subcutaneous injection of quinine is a valuable method of its introduction into the system. It possesses the advantage of economy, is easily applied however severe may be the vomiting, difficulty of swallowing, or coma.

Mr. W. Moore, of Bombay, has tried the hypodermic method on a large scale. He assures us that he has injected quinine successfully in 100 or more cases of intermittent and remittent fevers. The quinine must be used in solution, not in suspension. The best time to inject is before the cold stage.

Several French, German, and American physicians have advocated the subcutaneous method in all cases of intermittent, especially where quinine cannot be administered by mouth. I cannot, from my own experience, bear witness to the great advantages to be derived from the subcutaneous method. I have tried the plan eleven times, three times with a certain beneficial result; the effect was always a shorter duration than when quinine was introduced by any other method, and I had to renew the injection frequently. I would have injected more frequently had I not been deterred in my practice by the inconvenience from little accidents arising from the puncture made by the injecting syringe, some swellings, and often superficial abscesses, which were looked upon by my Spanish patients in Cuba with a most ridiculous degree of anxiety. For my part, I have trusted more, in the treatment of febris comatosa, to revulsives—hot mustard foot-bath, blisters to the calves of the legs, strong injections of quinine per rectum, having previously administered a purgative enema, strong frictions of quinine, etc. It is seldom that this plan fails to develope the malarious origin of this comatose form of pernicious fever; but in no case, however strong the indication may appear, however intense the symptoms may be, must we bleed. A couple of leeches may be applied over the mastoid process. When the tendency towards convalescence becomes established, should speech appear to be somewhat embarrassed, should we observe dulness and uncertainty in the gait, in such cases I have always derived advantage from the combination of calomel and quinine.

Let us consider, before we conclude, why the poison of malaria in a pernicious or highly destructive form produces intense cold (febris algida) in one case, and intense heat (febris comatosa) in the other.

The system of the great sympathetic presides over organic life. It brings into intimate relation and connexion, and into sympathetic harmony all, and even the most distant parts of the human system; and it is through its medium that all impressions and emotions, whether moral or physical, are conveyed, transmitted and manifested. When this system of nerve sympathy is impressed by the incubus of the miasmatic poison, independently of the brain, a profoundly depressing and paralysing effect is produced as the consequence. This impression is conveyed to the arteries, even to the remotest capillaries, the calibre of which is regulated by the sympathetic, causing—first, dilatation; next, contraction, and consequent obstruction to the circulation. Hence the gradual retrocession of the blood from the extremities; hence the intense cold, and cold sweats. Still, the intellect and the functions of the brain remain unimpaired; and thus is produced that form of malarious pernicious fever, febris algida. But supposing that, owing to certain conditions of the human body, the poison, instead of acting immediately upon the sympathetic system of nerves, should determine violently to the brain, when the body is in the full enjoyment of its natural heat, and in the performance of all its functions: in such a case the body is, as it were, stormed and taken by surprise.

The functions of the brain preside over animal, rather than organic, life; it directs—does not perform—the functions of the great sympathetic, through whose agency life and heat are carried on independently of the brain. We know that animals are sometimes born with a great deficiency or imperfection of brain or cerebral matter; and, nevertheless, life and heat are *carried on independently of* the brain for a longer or shorter period of time.

When, therefore, the function of the brain is suddenly overpowered and paralysed by the baleful incubus of marsh malaria, we have loss of motion and sensation; but the organic functions continue to work on, and the heat of the body—even greater than natural—is kept up to the last, until the patient recovers from the fit, or life becomes extinct. And this constitutes the comatose form of pernicious fever of malarious origin.—*Medical Times and Gazette, March* 11, 1876, *p.* 277.

9.—ON SALICYLIC ACID AS AN ANTIPYRETIC.

By Dr. C. A. EWALD, Assistant Physician to Prof. Frerich's Wards in the Charité Hospital, Berlin.

[Dr. Ewald has had experience of the use of salicylic acid in upwards of 100 cases, in which from 300 to 350 single doses have been administered.]

1. *Preparation and Dose.*—It is a matter of indifference whether the pure acid or one of its salts, best the sodium salt, be used. As, however, impure preparations, containing carbolic acid, &c., have a strong astringent and even caustic action, and since, in all probability, the acid undergoes conversion into the sodium salt in the blood, it is better to use the sodium salts at once. Whether, however, the acid or its salt be employed, it is necessary that each dose should be a large one, as small or divided doses have little or no effect. Generally speaking, the minimum dose required to reduce the temperature effectually is 5.0 grammes (77 grains). Should such a dose have no effect, one may after four or five hours with safety give a second, or indeed even a third similar dose. I have seen cases in which 15 or 20 grammes of the salt have been given during twenty-four hours without any ill effect. The salt is readily soluble in water, and is taken by most patients without complaint. In those rare cases in which malaise or vomiting occurred three or four drops of chloroform sufficed to remove them.

2. *Action on the Temperature.*—As a matter of course, the effect of the salicylic acid was not the same in each case, but it has proved to be more trustworthy and efficacious in its action than all other antipyretics. I have collected the results of one hundred single doses in cases of typhoid of nearly equal severity. In order to test the value of the drug more accurately, it was always given at midday, before the usual afternoon rise of temperature. Almost immediately, the temperature began to fall, the maximum result being reached, in most cases, from four to five hours after the administration of the medicine, but in some cases not less than eighteen to twenty hours were required. The subsequent rise of temperature was as gradual as its fall, but in mild cases it never reached the same height as before. These facts were established in many cases by thermometric observations made every ten minutes in the axilla and rectum. The following are the results obtained in this way, which have been confirmed by further experience. Where the drug had an effect the maximum fall, after its administration, was 4·3° C., where it had none, the maximum rise was 1·5° C. The temperature at 5 o'clock on those days on which, at 12 o'clock, five grammes of salicylic acid had been given, was more than one degree lower than the temperature at 8 o'clock in the morning of the same day, in 45 per cent., and less than one degree in 35 per cent. of the cases. On the whole, then, a reduction in temperature was observed in 80 per cent. The temperature was increased in 20 per cent., and in four cases the increase exceeded 1° C. These results prove the superiority of salicylic acid over all other known antipyretics.

3. *General Action.*—Within fifteen minutes, or even less, after the administration, a copious perspiration breaks out, first on the face, then on the thorax, abdomen, and the rest of the body, accompanied by reddening of the skin, more especially of that of the face, and may be so copious that the patients *may lose* 500–750 grammes of water. Almost simultaneously with the *outbreak of this* sweating, sometimes a little later, the temperature begins to *decline, the* gradual fall lasting much longer than the perspiration. Nor is

there, indeed, any constant relation between the fall of temperature and the amount of sweating, there being in many cases great reduction of temperature with little or no sweating. Generally the pulse and respiration are not at all affected, though the pulse may become a little slower. Where the pure acid or the sodium salt are employed, the intestinal tract does not appear to be at all affected. The recorded accounts of irritant effects on the mucous membrane of the œsophagus, stomach or intestines, even of erosions and hemorrhages, are due to admixture of irritant substances, such as carbolic acid, with the salicylic acid. This is shown by a comparison between my earlier experience with my later, as I have not met with any such results since using the pure drug. The evacuations, on the other hand, become more frequent and fluid. The salicylic acid appears in the urine, which is otherwise unaltered, as salicyluric acid. The cerebral functions appear little or not at all interfered with, for so far as my own experience goes, only three patients have complained of buzzing in the ears and dizziness, and only one of hallucinations. Nor does such a collapse occur as one might have expected from the great fall of temperature. I have not, nor indeed have any others, ever seen a fatal case of collapse, and although several patients, especially such as have sweated profusely, appear during the fall of the temperature or shortly afterwards much exhausted and very pale, this condition is at most rare and transitory. As it is quite possible that owing to so great a reduction of the heat of the body, a fatal collapse may occur, I have not been in the habit of giving the acid to very debilitated patients, or when I have done so I have at the same time administered analeptic and stimulating remedies.—*Practitioner, March*, 1876, *p.* 201.

10.—THE TREATMENT OF RHEUMATIC FEVER WITH SALICYLIC ACID.

By the Editor of the Medical Times and Gazette.

Like all new remedies, salicylic acid is being tested in a number of different diseases, and among these of course rheumatic fever occupies a prominent place, not only on account of its frequency, but also of its markedly febrile character. The results which have been obtained in Prof. Traube's wards at Berlin certainly afford not a little encouragement to indulgence in a hope that in salicylic acid a real remedy for acute rheumatism has at last been found. We extract the following details from a paper by Staff-Surgeon Stricker, in the Berliner Klinische Wochenschrift of January 3, 1876. For several months all the cases of acute rheumatism in which the local symptoms were strongly marked (fourteen in all) were treated with salicylic acid. The preparation used was, however, not the ordinary impure commercial acid, but one that by repeated crystallisation had been rendered almost perfectly pure. Thus prepared it consists of shining white needles, which have no smell, and dissolve completely in water and alcohol so as to form a clear solution. This pure acid can be given internally in considerable doses without any of those unpleasant results which have followed the use of the commercial acid, which probably owes its caustic properties to the presence of other substances—for instance, carbolic acid. The pure acid only excites some dryness in the mucous membrane of the mouth and pharynx, followed by an increased secretion from their surfaces. This inconvenience can, however, be obviated by giving the acid in half-gramme or gramme doses every hour, in the form of powder, and enclosed in a capsule; and in the treatment of rheumatic fever the administration is continued until the joints which were previously affected can be moved without pain. To quote Dr. Stricker's words, "All the patients thus treated were not only relieved of their fever, but also of the local symptoms—*i. e.*, the swelling, redness, and especially the painfulness of their joints,—within forty-eight hours; most of *them even within* a much shorter period." The largest quantity of

pure salicylic acid which was found necessary to produce this effect was fifteen grammes, and the smallest five grammes ; but that even larger quantities can be taken internally without injuring the digestive apparatus is proved by the fact that one patient actually took twenty-two grammes in the course of twelve hours through an excess of zeal on his own part; but, nevertheless, his tongue became clean and his appetite returned in the course of this vigorous drugging. As far as Dr. Stricker's observations go, the more acute the case the better the action of the acid. He finds it best to begin the treatment in the morning, for then its effects are generally so decided by the evening that it is unnecessary to disturb the patient's rest to give him his medicine. The general phenomena which were observed to follow large doses of the acid were copious perspiration, ringing in the ears, and slight deafness, and in two cases the patients became more than usually lively. Dr. Stricker does not pretend to express any opinion at present on the effect exerted by the acid on the cardiac complications of rheumatic fever. Most of his cases either had old valvular disease or else were suffering from a recent endocarditis at the time of their admission. The details of five cases are appended to Dr. Stricker's paper, and the temperature-sheets are given in graphic form in four of them, and we can only say that they confirm in a most striking manner what has been above stated as to the value of the salicylic treatment.

A further testimony in the same direction is that of Dr. L. Reiss (Berl. Klin. Wochenschrift, December 20, 1875, "On the Internal Use of Salicylic Acid"). He speaks of the results obtained in acute rheumatism as unexpectedly favourable, and points out that the action of the salicylic acid must be more than purely symptomatic, since in some cases a single dose not only permanently reduced the temperature, but also was followed by general improvement in the patient's condition. The large opportunities which our London hospitals afford for the observation of rheumatic fever should certainly be utilised for the further investigation of the value of salicylic acid. We again remind our readers that the acid used must be chemically pure. (*Pure* salicylic acid can be obtained from the Chemische Fabrik auf Actien (vormals E. Schering), Berlin, N. Feunstrasse 4.)—*Medical Times and Gazette, Feb.* 5, 1876, *p.* 144.

11.—TREATMENT OF ACUTE RHEUMATISM BY SALICIN.

By Dr. T. Maclagan, Dundee.

[The writer has tried all the usual remedies for acute rheumatism over and over again, and finds salicin to give better results than any.]

In the course of an investigation into the causation and pathology of acute febrile ailments, which has for some time engaged my attention, I was led to give some consideration to intermittent and to rheumatic fever. The more I studied these ailments the more was I struck with the points of analogy which existed between them. On a detailed consideration of these, I shall not now enter. Suffice it to say that they were sufficiently marked to lead me to regard rheumatic fever as being, in its pathology, more closely allied to intermittent fever than to any other disease, an opinion which further reflection and extended experience have served only to strengthen.

Rheumatic fever is now-a-days generally regarded as being produced by some cause or agency which is generated within the body. My own investigations into its pathology have led me to reject this view, and to adopt the old "miasmatic" view of its mode of origin, according to which the cause which gives rise to the disease is introduced into the system from without.

Holding this view as to the pathology of rheumatic fever, impressed with the points of resemblance between it and intermittent fever, and bearing in *mind that* we have in quinine a potent remedy against the latter, there *seemed to me good* reason for indulging the hope that some remedy would

yet be discovered capable of exercising a similar, if not equally beneficial action on rheumatic fever.

In reference to the action of quinine on the various forms of intermittent and remittent fever, and, indeed, with reference to the action of the Chinchonaceæ generally on the diseases of tropical climates (ipecacuanha in dysentery, for instance), there is one fact which has always strongly impressed me—the fact, namely, that the maladies on whose course they exercise the most beneficial action are most prevalent in those countries in which the Chinchonaceæ grow most readily; nature seeming to produce the remedy under climatic conditions similar to those which give rise to the disease.

Impressed with this fact, and believing in the miasmatic origin of rheumatic fever, it seemed to me that a remedy for that disease would most hopefully be looked for among those plants and trees whose favourite habitat presented conditions analogous to those under which the rheumatic miasm seemed most to prevail. A low-lying, damp locality, with a cold, rather than warm, climate, give the conditions under which rheumatic fever is most readily produced. On reflection, it seemed to me that the plants whose haunts best corresponded to such a description were those belonging to the natural order Salicaceæ, the various forms of willow. Among the Salicaceæ, therefore, I determined to search for a remedy for acute rheumatism. The bark of many species of willow contains a bitter principle called salicin. This principle was exactly what I wanted: to it, therefore, I determined to have recourse. It will thus be seen that the employment of salicin in the treatment of acute rheumatism was no haphazard experiment, but had a fair foundation in reason and analogy.

Salicin has long enjoyed a reputation for tonic and febrifuge properties, and was at one time a good deal used as a substitute for quinine. It has of late years, however, gone very much out of use, and now it does not even find a place in the British Pharmacopœia.

The idea of treating acute rheumatism by salicin occurred to me in November, 1874. I had at the time under my care a well-marked case of the disease (Case 1) which was being treated by alkalies, but was not improving. I determined to give salicin; but before doing so, took myself first five, then ten, and then thirty grains without experiencing the least inconvenience or discomfort. Satisfied as to the safety of its administration, I gave to the patient referred to twelve grains every three hours. The result exceeded my most sanguine expectations. For some days prior to its administration the temperature had ranged from 101·8° to 103°; the pulse was 120, and the joints were swollen and very painful. On the 26th of November the alkaline treatment was stopped, and that by salicin commenced. On the following day, after eighty-four grains of salicin had been taken, the pulse had gone down to 100, the temperature to 99·6° (from 102·8° the previous day), a fall of over 3°, the pain and swelling of joints, but especially the pain, had much abated, the joints could be moved a little, and the patient expressed himself as being much better. On the next day (Nov. 28th) the temperature was natural and the pain all but gone, the joints still remaining stiff. From this time he convalesced steadily and quickly.

The case was a very striking one; but, by itself, could not be regarded as proof of the beneficial action of salicin. I was quite aware that cases of acute rheumatism do sometimes unexpectedly improve without any treatment, and had no surety that this was not a case in point. It afforded me, however, strong encouragement to persevere with the salicin. This I did; and all the cases of acute and subacute, and several cases of chronic, rheumatism which have come under my care since then have been treated by this remedy, and with results much more satisfactory than I ever got from any other remedy—the results being most marked and most satisfactory in distinctly acute cases, and least so in chronic cases. Subjoined are the details of three cases.

Case 1.—*Acute Rheumatism.*—William R., aged forty-eight, was first seen on Nov. 24th, 1874. Had rheumatic fever eight years ago; was then confined to bed for eight weeks. With that exception has always enjoyed good health. Present illness commenced three days ago with shivering and pains in joints, which have increased in severity.

Nov. 24th. Has anxious, pained expression. Lies on his back without power of motion, the least movement causing intense pain. Skin covered with acid perspiration; tongue moist and furred; bowels moved by medicine; urine scanty and high-coloured; pulse 120, small and regular; temperature 101·8°; heart's sounds normal. To have twenty grains of acetate of potass every four hours, and ten grains of Dover's powder at bedtime. Food to consist of milk, beef-tea, and light puddings.

25th. Passed an almost sleepless night. General state unchanged. Has great pain in the joints, especially in the knees, ankles, wrists, and fingers, which are all a good deal swollen. Cannot move. Pulse 120, feeble; temperature 103°; heart's sounds a little muffled; skin bathed in acid perspiration. Continue treatment.

26th. Had an hour's troubled sleep after the Dover's powder. No change in general condition; lies on his back, quite unable to move; profuse perspiration; pulse 120, feeble; heart-sounds indistinct; temperature, 102·8°. Omit potass and Dover's powder; to have twelve grains of salicin every three hours.

27th. Had four powders (forty-eight grains) before bedtime yesterday. Passed a much better night; slept for several hours in snatches of an hour at a time. Expresses himself as feeling much better, and looks so; says the powders did him a deal of good; can move his limbs a little, but not without pain; joints less swollen; skin covered with acid perspiration; tongue furred; bowels not moved; pulse 100, of better volume, soft and compressible; heart-sounds clearer; temperature 99·6°. Has had eighty-four grains of salicin. To continue it.

28th. Had a pretty good night; pain nearly gone, though still felt on moving the limbs; joints almost natural in size, except those of the fingers, which are still swollen; skin not perspiring so freely; secretion still acid; tongue cleaning; bowels not moved. Pulse 84, of good volume and character; heart-sounds distinct and normal; temperature 98·5°. To have a dose of castor oil, and to continue salicin every four hours.

29th. Passed a good night; pains quite gone, and can move the joints freely. Is loud in his praise of the powders, every one of which, he says, he felt do him good; wishes to continue them. Pulse 72; temperature 98·3°.

From this time convalescence was steady and satisfactory.

Case 2.—*Acute Rheumatism.*—Mrs. B., aged thirty-three. First seen on Dec. 18th, 1874. On Dec. 15th was seized with pains in hips and knees, for which she was compelled to go to bed. Had been shivering and feeling out of sorts for two or three days before.

Dec. 18th. Complains of pain in both knees, and in left wrist, which are all swollen and tender; skin covered with acid perspiration; tongue furred; bowels moved by medicine; urine scanty and high-coloured; pulse 116; temperature 101·6°. To have twelve grains of salicin every four hours.

19th. Not much sleep; general condition unchanged. Pulse 116; temperature 102·2°. To take a powder every three hours.

20th. Better night; feels much better; can move knees without pain, though joints are still stiff; is quite free from pain; tongue cleaner; skin moist. Pulse 84; temperature 99°.

21st. Feels quite well; only a little stiff. Pulse 72; temperature 98·5°. Convalesced satisfactorily.

Case 3.—*Acute Rheumatism.*—Henry B., aged thirty-four, had rheumatic fever seven years ago; was ill at that time for six or seven weeks.

March 14th. Two days ago felt generally out of sorts; at night felt cold and shivering and had aching pains in limbs, especially in hip-joints. Complains now of pain in right shoulder, both ankles, and left knee, the ankles and shoulder being most painful; all the affected joints are slightly swollen. Feels just as he did when his fever came on seven years ago. Has anxious expression; skin covered with acid perspiration; tongue thickly furred; bowels moved by medicine. Pulse 112; temperature, 102·1°; heart's sounds normal. To have twenty grains of salicin every three hours.

15th. Rather restless night; ankles and shoulder not so painful, but left *knee more so*; through some mistake did not have the powders during the

night; free acid perspiration; pulse 120; temperature 101°. Continue salicin; heart's sounds normal.—Evening: Feels better; says the powders are giving him much relief. Pulse 100; temperature 99·3°. Continue salicin.

16th. Passed a much better night; skin moist; tongue less furred; expression much improved. Pulse 80; temperature 98·6° All the joints free from pain, though stiff and giving slight pain on motion.

17th. Feels quite well. Pulse 68; temperature 98·2°.

From so small an experience of salicin as I have had, I would not assert in anything like a dogmatic manner the full extent of its usefulness. I would simply indicate the following conclusions as those to which I have been led, and which, I hope, a more extended experience of its use may confirm.

1. We have in salicin a valuable remedy in the treatment of acute rheumatism.

2. The more acute the case, the more marked the benefit produced.

3. In acute cases, its beneficial action is generally apparent within 24, always within 48, hours of its administration in sufficient dose.

4. Given thus at the commencement of the attack, it seems sometimes to arrest the course of the malady as effectively as quinine cures an ague, or ipecacuanha a dysentery.

5. The relief of pain is always one of the earliest effects produced.

6. In acute cases, relief of pain and a fall of temperature generally occur simultaneously.

7. In subacute cases, the pain is sometimes decidedly relieved before the temperature begins to fall; this is especially the case when, as is frequently observed in those of nervous temperament, the pain is proportionally greater than the abnormal rise of temperature.

8. In chronic rheumatism, salicin sometimes does good where other remedies fail; but it also sometimes fails where others do good.

Regarding the action of salicin on the cardiac complications of rheumatic fever I have no experience. In Case 1, indeed, the muffled and indistinct character of the heart's sounds, which existed before its administration, disappeared with the general improvement which accompanied its use. But it needs not the details of cases to demonstrate that a remedy which curtails the duration, or mitigates the severity, of an attack of rheumatic fever, must of necessity diminish in a proportionate degree the risk of cardiac mischief. Neither is it doubtful that the general treatment most suited for rheumatic endo- or pericarditis is that which most surely and speedily cures the rheumatism. Rheumatic inflammation about the heart requires the same general treatment as rheumatic inflammation of a joint.

The dose of salicin is from 10 to 30 grains every two, three, or four hours, according to the severity of the case. Fifteen grains every three hours is a medium dose for an acute case. It is very possible that less might suffice; for I have not tried to find the minimum dose. It is very certain that a much larger dose may be given without producing discomfort.

Salicin is not soluble to any useful extent; it is best administered as a powder mixed with a little cold water. It is a very pleasant bitter. I have never found the least inconvenience follow its use.

When salicylic acid (originally prepared from salicin) was first introduced, I determined to try it; and in the one case in which I have had recourse to it seemed to do good to the rheumatism; but it caused so much irritation of the throat and stomach that I did not repeat it. This was, no doubt, due to its being impure; for Traube has lately been trying it in his wards at Berlin, and reports most favourably as to its action in rheumatic fever.

It is the publication of these observations that has led me to give to the profession so soon my favourable and prior experience of salicin in the same disease.

I have no doubt that Traube's observations are correct and that salicylic acid will be found efficacious in the treatment of acute rheumatism. But I have as little doubt that it is not so good as salicin for this purpose; for it is more apt to contain noxious impurities, it is not so pleasant to take, and it apparently requires a larger dose to produce its beneficial action.—Lancet, *March 4 and 11, 1876, pp. 342, 384.*

12.—ON SALICYLIC ACID.

By Dr. J. C. Ogilvie Will, Assistant Surgeon to the Aberdeen Royal Infirmary.

Although salicylic acid has been much vaunted by continental surgeons, more especially by Thiersch and Kolbe, as superior as an antiseptic to carbolic acid, it has not, so far as I am aware, come into general use in this country, and the recent discussion at the Clinical Society will probably not do much to advance its cause. A pretty extended trial of it has, however, convinced me that in it we possess an agent of extreme value in a large class of cases; but I do not intend at present entering on a detailed account of the cases in which it is found useful, but simply to direct attention to its value as an antiseptic, to its advantages over other substances used for a like purpose, and to a few of the forms in which it may be employed, with brief notes of some cases as illustrative of its beneficial action.

Godeffroy, by a series of careful experiments, proved that salicylic acid is three times as powerful in its anti-fermentative action as carbolic acid. He used dough formed of yeast, flour and water, to separate portions of which he added varying quantities of carbolic and salicylic acids, and noted the length of time that had elapsed before fermentation took place. In other experiments, milk, urine, beer, mustard-meal, and other substances have been employed, the results invariably proving that fermentation was either prevented or greatly retarded by the addition of salicylic acid. For example, fresh cow's milk mixed wih 0·04 per cent. of salicylic acid, curdled thirty-six hours later than a similar quantity of milk to which no agent had been added; urine to which salicylic acid had been added, remained clear and free from odour till the third day, while another specimen of the same urine, with which nothing had been mixed was putrid. Its anti-fermentative powers are already so well recognised by chemists in this country, that many of them add small quantities of the acid to such preparations as are liable to undergo fermentative decomposition, with most satisfactory results. These experiments are undoubtedly conclusive as to the value of the agent used as a preventive of fermentation, and experience has proved that it is equally reliable as a preventive and corrective of putrefaction when applied to sores and wounds, and that it materially assists reparative action.

In proof of its powers as a corrector of putrefaction, I may briefly refer to two cases: one of amputation of the thigh, at present under Professor Pirrie's care in the Aberdeen Royal Infirmary; the other, mammary cancer.

The former patient, a girl aged nineteen, was the subject of extensive necrosis of the femur; she was much reduced, and amputation was had recourse to, but with very grave doubts as to the ultimate result. The vessels were acupressed and water-dressing applied. As was expected, there was considerable suppuration, accompanied by great fetor. The applications used at this time were daily syringing with 1 to 40 solution of carbolic acid and dressings impregnated with red lotion. Salicylic ointment was then applied, and within two days the fetor entirely disappeared and healing action commenced. I on several occasions directed the attention of the students to the almost marvellous change that in this case followed the use of the new antiseptic. Another noteworthy point connected with the case was the extremely small, healthy, and highly vascular condition of the granulations with which the lips of the wound were studded, forming a marked contrast to those which Mr. Callender stated he had seen when salicylic dressings were employed. The ointment used was the one containing paraffin, the formula for which will be found below, and though it is a pretty strong one—1 part of acid to 7,—the patient repeatedly stated that it neither gave rise to pain nor smarting.

In a case of medullary cancer of the mamma, where the fungoid growth involved the entire gland, extending upwards nearly to the clavicle and well down into the axilla, and from which the fetor was so intense that the patient had to be removed to an out-of-the-way apartment, I ordered daily *syringing with* a 1 to 40 carbolic solution and a liniment of olive oil and *salicylic acid*, with which the sore was covered. By these applications putre-

factive changes were arrested, the fetor disappeared, and the patient was rendered comparatively comfortable, while the attendants were not, as before, repelled from attending to her, which they had been by the disgusting odour pervading the atmosphere surrounding her.

These two cases of themselves show that salicylic acid is a trustworthy antiseptic. But carbolic acid has been proved beyond doubt to be so also, and boracic acid is largely used for similar purposes; therefore, unless salicylic acid possesses advantages over both, its substitution for either cannot be justified. It does, however, seem to me to possess certain advantages, which, though few in number, are not of less importance on that account; they may, I think, be best elicited by comparing carbolic and boracic acids with it. The two manifest objections to the use of carbolic acid, valuable agent though it be, are its irritating action and its smell. Salicylic acid can hardly be termed an irritant, and preparations containing only a small percentage of it can be thoroughly relied on as trustworthy antiputrescents, and it is odourless. These two points constitute its main claims to superiority to carbolic aid. The more important of the two is, however, not yet universally allowed, for, from the statements made by Mr. Callender and Sir W. Jenner at the Clinical Society's recent meeting, it would seem that in their experience salicylic acid had displayed most markedly irritant properties. But this is utterly at variance with the observations of continental observers, and also with my own, even where very much stronger preparations have been employed.

Preparations of Salicylic Acid.—Thiersch, who follows Lister's mode of treatment, with the exception of the substitution of salicylic for carbolic acid, employs cotton wadding or jute impregnated with the acid in place of gauze; but as the preparation of his dressings is a complicated process, and requires a lengthy description, I may refer to notices of his paper which appeared in a medical contemporary for May 26th and June 2nd of the present year, where full particulars are given. The watery solutions employed by him contain 1 part of acid in 300 parts of water. As an application to granulating surfaces a lotion containing 1 part of acid, 3 of sodium phosphate, and 50 of water has been found useful. As already mentioned, heat and the addition of borax increase its solubility; a clear lotion of considerable strength can thus be obtained: for instance, 10 grains of acid can be readily dissolved in one ounce of water by heating and then adding six grains of borax, or even 20 grains of the acid will be taken up by an ounce of water if 14 grains of borax are added. These solutions, in addition to their use as lotions, may be used as gargles, where an antiseptic and astringent gargle is indicated. To a surface where it can be accurately applied, and where the discharge is slight, though I have tried it with excellent effect where it was profuse, the cerate suggested by Professor Lister for rodent ulcer—salicylic taking the place of boracic acid—is a nice application. The formula is from half a drachm to a drachm of salicylic acid, one drachm of white wax, two drachms of paraffin, and two drachms of almond oil; melt and rub up in a heated mortar. It should be spread on strips of muslin or fine linen.

Another ointment may be made of sperm oil, one drachm and a half; oil of theobroma, five drachms and a half; salicylic acid, from half a drachm to a drachm. This forms a thick paste, which should be thickly spread on lint. The heat of the surface acting on the oil of theobroma, a diffusable ointment is formed, which is a suitable application when it is desired to have the discharge thoroughly saturated with the antiseptic. An ointment less easily acted on by the body-heat consists of sperm-oil and paraffin, of each a drachm and a half; oil of theobroma, two drachms; oil of almonds, one drachm; salicylic acid, from half a drachm to a drachm.

A very simple and most useful ointment, and one which answers admirably in some affections of the skin, is formed of half a drachm to a drachm of the acid to seven drachms of simple ointment. Though neither watery nor oily preparations of this acid belong to what is termed elegant pharmacy, yet a liniment of salicylic acid and olive oil will be found of much efficacy in burns; as an example, I may cite a case of burn, involving the upper arm and nearly the *whole back of a* child aged seven, where I recently employed

it. Carron oil had been applied; and when my advice was requested, two days after, free suppuration had taken place, accompanied by great fetor. Lint soaked in olive oil and salicylic acid—12 drachms of the acid to 16 ounces of oil—was prescribed. The result was most satisfactory; the fetor disappearing, the suppuration rapidly decreasing, the pain greatly abating, and kindly healing action taking place. In less than a fortnight the whole surface was healed, with the exception of two small spots covered by healthy granulations, to which red lotion was applied. I have since found that a much weaker oily solution (two drachms of the acid to eight ounces of oil) was all-sufficient in a case of severe scald of the foot lately under treatment.

For cancerous sores Thiersch recommends dusting with the pure acid, or with equal parts of the powder and starch, or powder formed of charcoal and the acid might be employed for the same purpose, or for dusting over the face of poultices applied to sloughing surfaces. Endless preparations might be devised; but those I have described seem to me as useful as any combinations with which I am acquainted, and therefore I shall leave others to modify them in any way that may suit their tastes or modes of treatment.

Though I stated in the outset that I did not intend entering on details of cases, yet I cannot refrain from urging its use in eczematous affections, for nowhere is its beneficial action more marked than in them. In the eczema of children, more especially in that found affecting the head and face, it is far superior to any remedy I have yet employed; it was, in fact, the results attending the use of salicylic acid in a case of the kind that first convinced me of its value, and I have since found that others have formed a like estimate of it in similar cases. A child, aged 18 months, had been under my care for many weeks with a patch of eczema rubrum on the cheek; I had tried all kinds of local applications, and had given arsenic and iron wine internally, but with no avail; for though at times it seemed to be giving way to treatment, a fit of itching, I suppose, had caused the child to rub it, and increased irritation always followed. I had not before used salicylic acid, and had but little faith in good accruing from its exhibition, but as a last resource I prescribed an ointment containing one drachm of acid to an ounce of lard. When I next visited the child, a few days after, the patch had nearly healed and very shortly after it was perfectly whole. In another case the result was almost equally striking, but here it was the first application used. A child, aged six months, had a patch of E. impetiginodes on the occiput; it had first appeared about a month before. As some parts were thickly covered by crusts, a poultice was used to detach them, and then salicylic ointment was rubbed in. In six days every vestige of disease had disappeared. A brother and sister, aged three and five, were the subjects of eczema narium of short standing. Salicylic ointment was applied on a Friday, and on the following Monday the surfaces were perfectly healed. It is unnecessary to occupy space by entering on details of other cases, but I may simply say that in very many I have found it answer admirably.—*Lancet, Dec.* 18, 1875, *p.* 870.

13.—ON DIPHTHERIA.

By Sir John Rose Cormack, K.B., F.R.S.E., Physician to the Hertford British Hospital of Paris.

Diphtheria is a specific, contagious, asthenic, general disease. It sometimes occurs as an epidemic; but is always present in a sporadic form in some districts of country and in some towns—in Paris, for example.

The leading characteristics of diphtheria is an exudation, on mucous surfaces, wounds, and cutaneous abrasions, of cacoplastic lymph, which becomes the basis of a tough, leathery, coherent false membrane, which may be met *with on the* mucous membrane of the pharynx, larynx, trachea, bronchial *tubes, nares,* eyelids, and vagina, as well as around wounds. This false

membrane often forms on the edges of the tracheotomist's incision in cases of laryngo-tracheal diphtheria.

The pellicle of diphtheria is a leathery membrane, tough, and difficult to tear. It is not the product of "inflammation" in the ordinary acceptation of that term. It has as its basis a peculiar fluid exuded from the surface on which it rests. This fluid, which may be described as cacoplastic lymph, agglutinates a profusion of epithelial cells. The membrane thus formed consists of compact tenacious layers, which give it a stratified appearance.

The pellicle of scarlatinous sore-throat, on the other hand, is pultaceous and easily torn. In cases of scarlatinous gangrene of the tonsils, the substance which stimulates the false membrane of diphtheria will, on examination, be found to be sphacelated mucous membrane, with the addition of a pultaceous substance—a loose epithelial detritus. In a word, the important diagnostic distinction consists in the diphtheritic pellicle being a strong, tough membrane, and the scarlatinous simulation of it being a pultaceous, easily-torn stratum of detritus, or a portion of gangrenous mucous membrane.

The formation of the diphtheritic pellicle generally begins on one or both tonsils after two or three days of some precursory redness and swelling, which are often so slight as to be unobserved. The pellicle, in most cases, first shows itself as a white patch of exudation on one tonsil: from this starting-point, formation of false membrane proceeds—generally, but not always, in continuity—rapidly to both tonsils, the veil of the palate, the uvula, and the pharynx. This extension is accomplished in young children in from one to three or four days, and in adults less rapidly. From the pharynx, except in mild cases, the false membrane descends into the larynx. It is not so in scarlatina, the larynx being comparatively seldom affected in that disease. To quote the familiar clinical saying of Trousseau —"Scarlatina has no liking for the larynx."

Nevertheless, there exists in some cases a great difficulty in establishing an absolute diagnosis between diphtheria and scarlatina, in consequence of the unquestionable relationship which exists between the two diseases, notwithstanding their being pathologically distinct from each other. Diphtheria—as Graves and others have shown, and as Trousseau admitted in his later teaching—often follows so close in the wake of scarlatina as to seem to be one of its later stages. False membranes—diphtheritic membranes—form in the pharynx and larynx, as an immediate sequel of scarlatina. In such cases, diphtheria has closely followed or been engrafted on the original attack of scarlatina.

Discussions—unprofitable, meaningless discussions—have taken place in respect to the identity or non-identity of *diphtheria* and *croup*.

Diphtheria is the disease *sui generis* which has now been briefly described. Croup is not a disease—it is a name which authors sometimes apply to laryngo-tracheal diphtheria, and sometimes to several other diseases, which are essentially different in their pathology from diphtheria and from one another. If the word "croup" is to be retained in medical literature, it must, to avoid confusion, be applied to only a symptom—that is, to *stridulous breathing*, a symptom common to laryngismus stridulus, stridulous laryngitis, laryngo-tracheal diphtheria, and some other affections.

Most French physicians of the present day, adopting the views as well as the nomenclature of Betronneau and Trousseau, apply the names *croup* and *vraie croup* to the membranous sore-throat which is the local manifestation of the general disease first called by Bretonneau, and now usually designated, *diphtheria*. They apply to laryngo-tracheal diphtheria, the terms *croup* and *vraie croup* (true croup), to distinguish it from the *faux croup* (false croup), the non-membranous affection in which spasm with stridulous breathing is the predominating feature. Many of them in this way include together the non-inflammatory spasmodic affection (laryngismus stridulus) with laryngitis, which is nearly always a stridulous affection in infants. It is the "inflammatory croup" of various English authors. Francis Home, of Edinburgh, represented it as a stage of membranous croup (diphtheria). In his famous little monograph, he only describes eight cases, and of these, five are tracheal diphtheria and three laryngitis. As no false membrane was seen in these

cases, he—like many of his successors—jumped to the conclusion that the false membrane was absorbed, or its formation prevented by the treatment. For a long period Home's successors, British and foreign, continued to make the same mistake—and, indeed, till Bretonneau published the result of his clinical study, the error now adverted to was universally accepted as the truth. Cheyne mixed up tracheal diphtheria with laryngitis; and attributed the recoveries from the latter to the energy of the bleeding and purging —and the deaths from the former to the omission or imperfect adoption of that treatment. In 1810, the Emperor Napoleon offered a prize for the best treatise on "croup." All the competitors confused together laryngismus stridulus, common inflammatory laryngitis, and laryngo-tracheal diphtheria. Most English authors, when they write about "croup," really mean laryngitis and laryngo-tracheitis. If the term "croup" be so interpreted, it is of course totally different from "diphtheria," the disease which is the subject of this paper.—*Edin. Med. Journal, March* 1876, *p.* 799.

14.—DIPHTHERIA.

By Dr. Robert Bell, F.F.P.S.G., &c., Glasgow.

Perhaps the most difficult problem in medical science which remains to be solved is that which relates to the causation of zymotic disease. All are certainly agreed that each infectious disease is due to a specific poison which, by one way or another, gains access into the body of its victim; but what the nature of the entity is, and in wnat manner it enters and attacks the human subject, is still a mystery. I say, in what manner it *enters* the system of the patient is still not understood. I feel convinced that too much has been taken for granted, and accepted as fact on this point; and I am certain it will not be until this question has been satisfactorily settled that we shall arrive at correct conclusions as to the nature of the different poisons which we call contagia. It is all very well for us to assert that the disease-producing essence is inhaled by the breath, and thus gains access into, and produces its baneful effects upon, the individual. I hold that we have no proof of this theory being correct. It was at one time thought that typhoid fever was infectious; that it was by inhaling the poison in the process of breathing the disorder was contracted. I feel that those who have had most to do with the treatment of this malady will agree with me that typhoid is not infectious in this sense. Other instances might be cited, showing that our opinions on this important subject have recently undergone considerable change. In diphtheria especially, it appears to me that our conceptions with regard to the mode of ingress of the poison are very far from correct, and will not yield the fruit which we much desire to reap; viz., an effectual means of destroying the disease, and thus saving the lives of our patients. Some years ago, it struck me that, when diphtheria attacked a patient, the *modus operandi* was the following. The germs of the disease become located on a surface which provides a favourable soil for their development and multiplication, just in the same way as the germs of typhoid select the mucous membrane of the bowels. In the disease under discussion, the locality chosen by the poisonous particles is the throat and the neighbouring mucous surfaces. Here these *materies morbi* implant themselves, becoming attached by the tenacious and viscid secretion of the tonsils, the warmth and moisture of the part favouring their further development and progress. A dense fungoid growth is the result, at first of limited extent, but gradually encroaching upon the surrounding healthy mucous membrane. The very presence of this deposit—I refrain from calling it an exudation—results in inflammation of the subjacent and surrounding tissue. We may, and often *have, a diphtheritic* deposit without the slightest constitutional disturbance. *I have often seen* diphtheria in its early stage without the general system

having apparently been affected in the slightest degree; and I venture to say that diphtheria, in its incipient stage, rarely affects the general health. Moreover, if the patient be strong and robust, some time will elapse before constitutional symptoms will manifest themselves. On the other hand, if the victim be weakly and in feeble health, or if his vital energies have been laid low by breathing foul gases, the disease will run a rapid, and in general a fatal course. From what has been said, it will be perceived that I conclude diphtheria to be, in its first stage, purely a local disease, exactly as a chancre, at its commencement, is syphilis in the part only, not having yet affected the general system; or, to take another example, just as vaccinia, in its primary stage, is purely a local lesion. Another example may be cited; viz., the snakebite, which, if caught in time, may have its venom limited to the part bitten. It is, therefore, in this stage of the disease that an effectual and speedy cure can be guaranteed. When, however, the disease has for some time established itself on the tonsils, poisonous matter from the film becomes absorbed, first by the lymphatics, as indicated by the hardening and enlarging of the neighbouring glands, and then the general system becomes impregnated, and it is at this time that the greatest danger threatens the patient; the vitality becomes reduced, and the poisonous film spreads with increased rapidity, the poison becoming multiplied with most deadly speed within the body. The above conclusions have been gradually arrived at after carefully observing a large number of cases of this dreadful disease. It is now time to say a word or two on the nature of the deposit, which is the principal feature of diphtheria. This always begins in one or more minute specks or points. These gradually enlarge to such an extent, and coalesce so, as sometimes to cover the whole area of the throat, and often the palate, posterior nares, and larynx. On its first appearance, it most closely resembles an aphthous spot, and indeed the aphthous and diphtheritic diseases bear a very close resemblance to each other in many ways. They both attack the mucous membrane of the mouth and throat; their appearance to the eye is similar; they both indicate a weakened condition of the general health; they are both fungoid in their nature; and I am not sure whether the one may not degenerate or merge into the other. Bearing these points in mind, it is always a safe plan of treatment to destroy in the early stages any deposit of a suspicious appearance on the tonsils or other surface of the throat; and it now remains to be seen how this can be accomplished. If what has been said anent the nature of the film, and the portal by which the disease enters the circulation, be correct, it follows that, if we can destroy the poisonous quality of the film while the disease is yet local, we keep it in that condition, and prevent its further effect on the health of the patient.

I may premise my remarks on treatment by stating that, since I have adopted my present method, I have only lost two cases from this disease; and these were children who resisted me to such an extent, that it was absolutely impossible to employ the treatment at all. It has been my lot to treat a large number of patients suffering from this disease, and it is with gratitude that I say with almost uniform success. My first consideration is to view the disease as one entailing rapid and severe prostration. This thought impels me to insist on free stimulation and plenty of nourishment, in the shape of soups, jellies, and milk, and this from the very onset of the disease, so as to assist the *vis medicatrix naturæ* to combat successfully the disease, and, if possible, expel it from the system. The grand aim is to endeavour to prevent the vital energies from succumbing to the fearfully prostrating effect of the poison. This dietetic treatment must be simultaneous with local and general medical treatment; but the most important, in my opinion, is the local application of substances which destroy the poisonous properties of the deposit on the throat. This consists of carbolic and sulphurous acids along with the liquor ferri perchloridi. My application generally consists of carbolic acid, one part; sulphurous acid three parts; solution of perchloride of iron and glycerine, of each four parts. This is either applied with a large camel-hair pencil, or by means of the spray-apparatus, *at intervals of two* hours. The mouth should also be frequently

rinsed out with a weak solution of Condy's fluid in water, and the following mixture taken in dessert-spoonful doses every two hours :—℞. Potassæ chloratis ʒ iij ; acidi sulphurosi ʒ iijss ; tincturæ ferri perchloridi ʒ iij ; glycerini ℥ i ; aquæ q. s. ad ℥ vi. M. In this way, a medicament is applied to the throat every hour, and, to be successful in curing the disease, this energetic treatment is absolutely necessary. Of course, if the patient be sleeping, the usual rule must be observed ; viz., never disturb a patient if asleep.

In conclusion, I may remark that the presence of albumen in the urine must not be looked upon as a necessary symptom of diphtheria, as it often does not manifest itself till far on in the disease ; and, on the other hand, I have often observed albuminuria as a concomitant of ordinary sore-throat. It should also be remembered that, at certain periods of the day during the progress of digestion, albumen can often be detected in the urine when no disease is present.—*British Medical Journal, Jan.* 29, 1876, *p.* 131.

15.—THE UNIVERSAL DISINFECTING POWDER.

As is well known to most, disinfectants belong to two groups—viz., such as attack and destroy bodies already in a state of decomposition, or about to pass into such a state; and those which hinder bodies from becoming decomposed. To the former group belong such substances as chloride of lime and permanganate of potash; of the latter, carbolic acid is the best exemplar. Moreover, as some of the most noxious and disagreeable products of decomposing matter are either gaseous or suspended in the air, a proper disinfectant should be capable of attacking aëriform bodies—*i.e.*, should be itself in the gaseous state, in part at least. There is only one element which combines all these properties, namely, chlorine. This has the power of destroying, or combining with, nearly all putrescent compounds; whilst the chlorides themselves have notable powers of arresting decomposition. Even the simplest and best known of these—common salt—is useful in this way. In no form have we seen these properties so well utilised as in the Universal Disinfecting Powder, which unites the double properties of containing preserving chlorides and of giving off, when wetted, nascent chlorine; thus exercising a twofold power of attacking putrescent and putrescible matter. The substance itself somewhat resembles bay-salt, and gives off a weak odour, far from unpleasant, of chlorine gas. It may be used either in the solid form or dissolved in water, and, being composed of alkaline or earthy chlorides, when so dissolved does not possess the acrid properties of a simple solution of chloride of zinc, and consequently is not poisonous like the well-known Burnett's fluid. In either form, after due trial we can amply recommend this new disinfectant as likely to be a boon to the public—efficient, yet safe. Might we suggest, however, to the proprietors the usefulness of that system, now adopted for so many things, of having the lid perforated, should this be compatible with their object in furnishing an efficient disinfectant ?—*Medical Times and Gazette, March* 25, *p.* 347.

This new disinfecting powder meets a great public want. It is cheap, highly effective, and free from the danger of producing accidental poisoning to which other well-known disinfectants give rise with such lamentable frequency. It is perfectly soluble, colourless, and free from odour. These are qualities to make it valuable for daily and popular use. It is manufactured by Messrs. Ledger and Co., Lant Street, Southwark. It has been found very effective by many medical officers of health who have practically tested it, and has been favourably reported on by Mr. Wanklyn and Mr. Bartlett, two of our most eminent experts in the chemistry of disinfection, and will now no doubt find its way into popular use in towns and rural districts, and *in ships, hospitals*, slaughter-houses, stables, &c.—*London Medical Record, March, p.* 143.

16.—ON CHLORIDE OF LEAD AS A DEODORISER AND DISINFECTANT.

By Dr. R. H. GOOLDEN, London.

I wish to call the attention of medical practitioners and especially of sanitary officers, through the Lancet, to the value of chloride of lead as the most powerful and economical agent for eliminating sulphide of hydrogen from the atmosphere, as well as from all organic matter in a state of decomposition or putridity. There is nothing new in this fact. It is known to all chemists, but its application has been practically disregarded, owing to the popularity of other deodorisers, which having been made the subjects of patents are well advertised, and therefore generally adopted, and they certainly do answer the purpose with more or less completeness. Of these I may instance—Chloride of zinc (Burnett's), chloride of aluminium, hypochlorite of soda (Marvel Fluid), hypochlorate of potassa, hypochlorate of lime, permanganate of potassa (Condy's), permanganate of lime, peroxide of iron, peroxide of manganese, powdered charcoal, bog earth, and alluvial earth.

I need not enter into the *rationale* of the chemical action of these several ingredients, nor do I suggest the substitution of chloride of lead for the three last-named substances when it is proposed to convert organic matter into reproductive soil for farming or gardening purposes, but only in those cases where it is necessary to purify a fetid atmosphere, which has to be breathed by living people.

It has already been objected that zinc and manganese have been detected in plants grown in soil manured by stable-dung, which had been deodorized by Burnett's and Condy's fluids. I do not know how far the fact has been established, but even the suggestion is of such importance as to make us very careful in proposing the use of lead, unless it can be shown that lead is not in the same category. I think we may arrive at a strong inductive probability that it is not so ; for the lead sulphide is quite insoluble except in strong nitric acid, in boiling hydrochloric acid, and in aqua regia (which is not the case with zinc or manganese) ; nor is lead sulphide absorbed in the human body when swallowed, but passes on by the bowel as harmless as powdered charcoal ; and the affinity of lead for sulphur is so strong that lead sulphide cannot be resolved but at a very high temperature. Another safeguard lies in the very sparing solubility of lead chloride, and also in the very small quantity used in the deodorising process.

The chloride of lead and sulphide of hydrogen react with a simultaneous double affinity, producing an insoluble lead sulphide and hydrochloric acid. Lead is so readily acted upon by sulphur, that metallic lead and oxide of lead in paint, even when protected by the dried oil, is turned black in any atmosphere where sulphide of hydrogen exists. White paint in stables, waterclosets, and in artists' paintings, is soon turned black by it and spoilt.

To prepare it for use, take, for ordinary purposes, half a drachm of nitrate of lead, dissolve it in a pint or more of boiling-water—(nitrate of lead is a soluble salt, and very cheap ; it may be had in any quantity for about a shilling a pound, and should be much cheaper if bought in large quantities), —and dissolve two drachms of common salt (chloride of sodium) in a pail or bucket of water ; pour the two solutions together, and allow the sediment to subside. The clear supernatant fluid will be a saturated solution of chloride of lead. A cloth dipped in this solution and hung up in a room will sweeten a fetid atmosphere instantaneously, or the solution thrown down a sink, water-closet, or drain, or over a heap of dung or other refuse, will produce a like result. Even the tarnishing of gold and silver plate may be prevented by a rag dipped in the solution being hung up in the room or window where it is exposed.

It will thus be seen that one great advantage of chloride of lead over all other deodorisers lies in its great cheapness. The cost of the quantity of nitrate of lead required for use may be estimated at a fraction of a farthing; it is easily *carried about*, or may be sent by post; it is a dry solid, is not

caustic, nor will it discolour or blister the skin; it can be kept in paper or a pill box, and therefore does not require a glass or other fragile bottle. The exact equivalent proportion of nitrate of lead and chloride of sodium would be 100 to 317 in weight. As it is necessary that the whole of the nitrate of lead should be converted into chloride, a slight excess of salt is desirable, but as chloride of sodium in the solution renders the chloride of lead even less soluble than in water, I have adopted the weights respectively as half a drachm to two drachms—sufficiently correct for all practical purposes. 331 grains of nitrate of lead converted into lead chloride are sufficient for 34 grains of sulphide of hydrogen. Now 36·38 grains of sulphide of hydrogen represents 100 cubic inches—a quantity quite ten times larger than under ordinary circumstances we are likly to have to deal with.

In sick rooms, hospitals, and crowded assemblies, we have to deal with the sulphide of hydrogen and ammonium, given off by the resolution of organic, especially albuminous matter in decay, or eliminated from the living body in fæces through the skin and with the breath ; and it must be borne in mind that whenever great numbers of people are crowded together in rooms, as in balls, concerts, theatres, or schoolrooms, the human body gives off an amount of sulphide of hydrogen, and that it is this, and not the carbonic acid, that makes people exposed to such an atmosphere so depressed, and which, when highly concentrated, develops typhus poison. The quantity is indeed very slight compared with its power of offensiveness, as in the analogous case of various flowers whose scent is most powerful, producing a sensible effect upon the human organism, and yet the agreeable or offensive matter composing it is too small to be detected by any test except the olfactory sense ; and hence it is that the small quantity of lead chloride contained in the solution is found practically to be quite sufficient to sweeten the most offensive room, and, in my experience, to deodorise any drain, water-closet, or sink.

A not less important direction, in which the use of the chloride of lead would prove of the utmost value to H.M. navy and the mercantile marine, is for the purification of bilge water, and of the close, fetid atmosphere between decks in emigrant and passenger ships; easy of transport, occupying little room, and safely stowed away in paper or wooden boxes. The sea-water requiring no addition of salt, the solution is made without trouble, and need merely be thrown down into the bilge, where the ship's motion completes the process.

The following cases, which have occurred in my own practice, will illustrate its use and successful application :—

Case 1.—A lady living in Chester-square, who was suffering from sciatica, consulted me many years ago, and my attention was called to a large tumour in the external part of the hip-joint. The tumour was soft and not very prominent, had been very gradually increasing, and with its increase the sciatic pains became more severe. Believing it to be a fatty tumour pressing on the sciatic nerve, I could only refer her to a surgeon for its removal. It was accordingly removed by Mr. Lane, and without any hemorrhage at the time, and proved to be a large fatty tumour the size of a child's head. The sciatic pains ceased, and the patient appeared to be in a fair way to recover speedily the effect of the operation. About a week afterwards I was asked to meet Mr. Lane, and found that the cavity from which the tumour had been removed had been distended with blood in a state of decomposition, the patient suffering all the symptoms of blood-poison: small rapid pulse, black sordes coating the mouth, tongue, lips, and nose; wandering, muttering delirium; she would take no food. The room was most offensive, the smell penetrating to the passages and other rooms. Basins containing Condy's fluid, Burnett's fluid, and bog-earth were in various parts of the room, but exercised little influence over the fetid emanation.

Wishing to try the effect of the lead chloride, we obtained, with great difficulty, a small quantity of nitrate of lead, and prepared the solution as above described. A towel dipped in it was hung up in the room, and *instantaneously the* smell disappeared. The wound was dressed, and over the *wound some lint* dipped in the solution was placed. The next day we met,

and found our patient sitting up in bed quite cheerful, with a clean tongue and good pulse, enjoying a mutton-chop and some port wine. The room was perfectly free from smell.

I have had many other opportunities of using this solution with equally satisfactory results, especially in paralytic cases, where, towards the end, the fetor of the breath and emanations from the skin are most offensive.

Case 2.—Three years ago, after a very severe storm-shower, the large drain at the back of the University Club was burst by the flood, and opened to the atmosphere. A more distressing smell in its immediate neighbourhood could hardly be imagined. Carbolic acid was used in the Club, which substituted only one stink for another. I sent the steward for a pound of nitrate of lead, of which half an ounce was used. A towel wetted with the solution was hung up in each room, and the rest poured down the drains and into the sewer, and immediately all smell was gone. The neighbours, who were unaware of what was being done, expressed the greatest surprise at the sudden disappearance of the nuisance. Although the drain remained open for some days until it could be repaired, there was no more inconvenience felt from the smell.

Case 3.—The wife of a horse-jobber in a very large way of business, apparently suffering from the poison of carbolic acid used to disinfect the stables where she lived, consulted me. She informed me that although the stables were well-drained and well-ventilated, the effluvium from the large number of horses and the accumulation of dung was so offensive that they had been induced to use carbolic acid, which, though painfully disagreeable, was not so offensive as the stable exhalations had been. It appeared also that since the use of carbolic acid they had lost seventeen horses, and that they could not help connecting their loss in some way with it. I recommended the immediate disuse of the carbolic acid, and in its place to try the nitrate of lead and salt. In a fortnight I saw her again in perfect health, and learnt that the stables had, from the first application, become freed from all disagreeable odour, and that the dung-pits into which some of the solution was regularly sprinkled were now sweet, to the great contentment of the horsekeepers and stablemen, with whom the removal of the dung has always been a subject of great difficulty.

Case 4.—Some years ago, when visiting one of H.M. largest ships, I casually heard loud complaints of the nuisance caused by the bilge water. Through the courtesy of the officers, which was greater than their faith in any possible remedy, I was allowed to try the experiment of removing it, and, having procured half an ounce of nitrate of lead, it was dissolved in a bucket of boiling fresh water, and thrown down the bilge when the ship was rolling slightly. The effect was the instantaneous disappearance of all smell; a large white precipitate, which immediately afterwards became black, subsided to the bottom, and the bilge water became perfectly clear. The cost was one halfpenny.

I have selected these few cases as leading types of the application and results of chloride of lead as a deodoriser and disinfectant, and only trust that they may be sufficient to lead my readers to continue the experiments in different directions, as I have hitherto found it to be the most simple, the most economical, and most successful of all the processes which have come under my notice.—*Lancet*, *Dec.* 11, 1875, *p.* 828.

17.—ON THE SUBCUTANEOUS INJECTION OF QUININE.

By Surgeon-Major George Yeates Hunter, Presidency Surgeon, Bombay.

[The subcutaneous injection of quinine in malarious fevers has been largely practised in India, especially when rapid action is desirable, or when from irritability of the stomach the drug is not well borne in the usual way of administration.]

I have often tried it in scattered cases, and not unfrequently been disappointed in its action, and embarrassed by its sequelæ in the shape of troublesome ulcers. However, thinking the latter might have been due to want of sufficient care, or to the employment of a solution too acrid for the purpose, and knowing that in some obstinate cases I had found fever which had baffled me when adopting the ordinary treatment, yield to this mode of administering the great specific remedy for malarious fever, I determined to give subcutaneous injection of quinine a fair trial in the Bombay House of Correction, using six minims for a dose of the following preparation:—Citric acid, three hundred grains ; quinine, eighty grains ; distilled water, one ounce. To be dissolved with the aid of heat (six minims of this solution being equal to one grain of quinine).

I think it may be conceded that the fever yielded as soon as when treated per os, if not sooner, the table showing that in most cases the attack was arrested on the second day, and in no case later than the fourth, notwithstanding the irregular mode of treatment as to time, &c., consequent on the patients being prisoners in a gaol.

Beyond all question there was a great saving in the quantity used, the cases being conducted to a satisfactory conclusion, so far as fever was concerned, with a very moderate expenditure of quinine, say three grains or so. On the double ground of checking the fever and economy in the consumption of the drug, this mode of treatment would seem to be superior to the old method, but, unfortunately, a drawback presents itself in inflammation at the point of insertion of the syringe. And, of the cases treated, two only escaped, all the rest having been more or less affected, some of the inflamed punctures assuming the form of inflamed vesicles, and others that of unhealthy ulcers, and in every case there was pain enough to disable the patient from working with that hand, the ulcers taking from six to seven days to heal.

The two who enjoyed immunity were healthy subjects of sound constitution, which would lead to the inference that the cases for this treatment ought to be selected.

I need scarcely say that most of the prisoners are men of dissipated habits —cachæmic, cachectic, and many completely broken down by a career of debauchery, a large proportion being opium-eaters or ganjah-smokers, or addicted to excessive use of country liquors—men constitutionally so unsound that the slightest abrasion may cause after-trouble.

I think I am justified in drawing the following conclusions from my experiments on this series of cases :—

1. However well adapted subcutaneous injection may be to selected cases —well fed and set up, and of naturally good constitution,—it is inadmissible in the unhealthy class who fill our gaols.

2. The method is not really economical, on account of the loss of labour and consequent diminished outturn.

3. Time is not gained, as, although the cure of fever was speedily effected, a week was lost subsequently if ulceration occurred.

4. The operation, slight though it be, is by no means painless, however carefully it be performed. And it is not unattended with risk. I have heard of one fatal case of tetanus which followed its use, andappeared to be caused by it.

It seems to me that I have advanced sufficient arguments to throw a doubt upon the advisability of hypodermic injection of quinine in the cases of convicts. Those who gain a livelihood by manual labour, would find the sequel inconvenient should it occur, which, however, is less likely than in the case of broken-down prisoners; and in the army, where its value has been tested on a large scale, it has been found that men have been kept from drill on account of the subsequent suffering, even if the inflammation set up around the puncture did not run into ulceration.

While the result of my experiment would not invalidate the argument in favour of hypodermic injection in suitable subjects, still it would seem to establish the advisability of carefully selecting the cases. I certainly would not *venture to adopt it* in civilised private practice, although it might be expedient *in the cases of* villagers down by the dozen with fever, which holds good in

some malarious hotbeds up country in India, more especially in severe and intractable forms of fever, when rapidity of action might save life, and when economy in expenditure becomes an object on account of the number treated.

Surely it is rather a barbarous procedure to perform a surgical operation, however slight it may apparently seem, to attain a medical object, when such object is attainable by other means.

My impression is that when the orthodox channel is closed, in consequence of the intolerance of the stomach, or otherwise, and when the weakly state of the patient renders it not unlikely that the subcutaneous tissue may resent this short cut into the system at its expense, the wiser plan would be to exhibit the drug per anum; but the circuitous route per os, when practicable, is incomparably better and safer, and quicker too, should the short cut have the penalty of ulceration attached to it.

On the recommendation of an officer of the Sir Jamsetjee Jeejeebhoy Hospital, I have since tried the solution of the neutral sulphate with great success, so far as checking the fever was concerned, and with certainly less trouble from sequelæ; yet, although more cases escaped ulceration, whilst I write the worst case I have seen is under treatment, and which followed the use of the neutral solution two months ago. So, although it is a better preparation than the other, barring the crystallisation of the salt and necessity of using hot water to obviate the clogging of the syringe, which, moreover, requires constant washing and oiling, and quickly wears out, still I am not prepared to say that even this solution should be of general application.—*Lancet, April* 8, 1876, *p.* 527.

DISEASES OF THE NERVOUS SYSTEM.

18.—ON THE VALUE OF ELECTRICITY AS A THERAPEUTIC AGENT FOR THE RELIEF OF PAIN.

By Dr. Leslie Jones, late Surgeon to the West Cornwall Hospital, &c.

[In the following paper those cases only are referred to in which pain constitutes the chief subjective symptom.]

I am convinced that comparatively few physicians give electricity that credit which is its due, and thus this most useful agent, especially in respect to the relief of pain, is too generally allowed to remain neglected.

The following cases fairly represent what can practically be done with electricity for the relief of pain; they are chosen from a considerable number, but any of the others would equally well answer the object I have in view; and this will be accomplished if any one who has not already tested the value of electricity will be induced by looking over these notes to give it an impartial trial.

Stöhrer's continuous current battery with thirty cells is the one I use, and I have not yet met a case in which a greater number of cells was required: it may be well to add that the sponges supplied with the machine are far too small. I use whole Turkey sponges, from two to three inches in diameter, firmly tied over the ends of the ordinary electrodes; by this means, the sponges being well soaked in water, or salt and water, the burning sensation so much complained of, especially when the application is made to the rectum, is greatly reduced. In every case it is better to begin the application from a few cells only, and gradually increase the strength of the stream to the point required, as the greatest difference in the effects produced will be noticed in different individuals. In cases too where the sponges have to be applied to the head or spine the patient should constantly be asked if there is any dizziness, and if this supervenes the application should be immediately discontinued.

Facial Neuralgia.—Two forms of facial neuralgia are described by Dr. Althaus; "*a mild one* and a severe one, the former comes on after exposure

to damp and cold, or after mental emotions, or is owing to caries of a tooth; it is not made worse by moving the face, and it occurs at all periods of life; while the latter occurs generally without any apparent cause, is almost entirely confined to advanced age, and is brought on or made worse by the least movement of the face." I shall illustrate the effects of galvanism in two cases of the first form of the disease, and in one of the second form, or Fothergill's disease; in which operative treatment frequently, and medicinal treatment invariably proves useless. In this instance (Case 3) the beneficial effect of galvanism was most striking.

Case 1.—*Tic-douloureux of two years' standing relieved by one application of galvanism.*—Miss N., æt. 24, came under my care in June last, suffering from neuralgia of the left side of the face, and which, without cessation for three days previously, had caused intense pain; during that time she had not taken solid food, had not slept, and now appeared to be fairly worn out with pain and want of food and sleep; otherwise her general health was excellent and the teeth were perfect. Two years ago the neuralgia had come on after a debilitating and protracted illness, and since then had tormented her with variable intermissions, seldom, however, leaving her for long. She had got so tired of trying different remedies that, to use her own words, she "believed the only thing to do was to let it wear itself out." At the present moment her face was blistered from some liniment she had been using; it is difficult to describe the agony she was apparently enduring, walking about the room imploring me to do something to ease the pain. Using six cells of the continuous-current battery, I applied the moistened sponge of the negative pole in front of the ear and on the temple, and the second sponge interruptedly over the infra-orbital region and on the cheek. I had scarcely applied the sponges when she seized the handles of the reaphores and tightly pressed the sponges to her face declaring that the pain was going. I continued the application for five minutes, when she said the pain had gone. The day after this the lady came to me stating that she had slept well and enjoyed her food and had had no return of the pain, but asked for another application in case she should. I have just now heard from her that, since that time, now six months ago, she had been perfectly free from pain.

Case 2.—*Neuralgia of the face due to pregnancy cured by three applications of continuous current.*—Mrs. B., æt. 37, five months advanced in her first pregnancy, complained of great and unremitting pain in the left side of the upper jaw; two teeth had been extracted, different applications used, quinine and various medicines taken, but all with the same result, the pain continued. I applied one sponge, the negative pole, over the infra-orbital foramen, the positive sponge inside the mouth, over the painful teeth, gums, and antrum, retaining the negative sponge in position and slowly moving the positive sponge over the painful parts. I used the current from six cells, and continued the application for five minutes. The lady left my house completely relieved, but returned next day, the pain having recurred. I repeated the galvanism twice, and during the remaining three weeks of her stay in Blackpool there was no return of the pain.

The beneficial effect of galvanism in this case was especially interesting, as the neuralgia was no doubt due to the existence of pregnancy, and these cases are noted for the persistent character of the pain even when the painful teeth have been extracted.

Case 3.—*Fothergill's disease; pain relieved after three applications of galvanism.*—I was asked to visit Mrs.——, an old lady of nearly 80 years, whom I found in bed in a most prostrate and exhausted condition. For years past she had suffered intense paroxysms of pain in the right brow, temple, and down the right side of the nose; but she described the present attack as the worst she had ever endured. The eye could scarcely be seen, owing to the puffed and swollen state of the forehead, eyelid, and nose; this she described as erysipelas, with which, she said, the painful attacks invariably terminated; in fact, she looked upon th erysipelas and the pain as cause and effect, the latter *only abating* when the former "came out." I tried to assure her that there *was no erysipelas*, that the tender and swollen condition of the face was owing

to neuralgia, and that I believed nothing would give her permanent relief except the application of electricity; but in this I failed, and was forced to content myself with prescribing pills containing quinine, belladonna, and cannabis indica. As might be expected, without effect; the pain continued. At last, after much persuasion, she was induced to let me try the electricity. I began with only two cells of the continuous battery, and used very gentle pressure, because I was not certain that I had not to deal with a case of neuritis of the trifacial nerve, but the application of galvanism quickly set the question at rest; for independently of there being no anæsthesia or muscular palsy, the patient herself requested that I should "press harder" and increase the power of the current. Dr. Althaus lays stress on this fact as a reliable means of diagnosis between neuritis and the severe form of neuralgia; in the former disease patients dislike the application of the continuous current, in the latter they relish it. Increasing the strength from four to six cells, I applied the sponges irrespective of the poles, at short intervals all over the painful parts and continued the application for five minutes. Considerable relief was afforded by the first application.

On the following day the swelling was scarcely visible, though the surface of the face was still very sensitive ; after the third application the pain had gone. For some weeks after, at the old lady's request, I applied the galvanism every third or fourth day, using two or four cells; her health greatly improved, her appetite returned, she was able to take long walks, and left Blackpool at the end of two monts hperfectly well.

Sciatica.—I have treated so many cases of sciatica with the continuous current, and so invariably with the same result, that it is quite at random that I choose the two following cases; the effect of the current when thirty cells are used is almost certain; the pain ceases and temporary numbness of the limb is produced. I believe that when applied in the manner described in Case 6 the conductibility of the nerve is partially arrested.

Case 6.—Mr. J., æt. 45, sent for me five months ago in consequence of a severe attack of sciatica in the right thigh. I found him sitting on a chair with the painful leg stretched out, pressure or movement causing unbearable pain. With difficulty he hobbled to my house and when he got into my room described the pain as "something awful." There was a distinctly painful point near the middle of the thigh. Using the full force of the battery, thirty cells, I applied the negative sponge outside the tuberosity of the ischium over the sciatic nerve where it emerges below the pyriformis muscle, and the positive sponge to the popliteal space ; thus including the painful part between the sponges. He declared he could not bear the pain of this, but I persisted for nearly five minutes with the application, my patient roaring with pain the greater part of the time; when I removed the sponges he was astonished at finding the pain had gone, he pressed on the part that had been so painful and kicked out his leg to make sure that there was no mistake about it, and finally walked home without a limp. There was a slight numbness in the leg next day; but since then there has been no return of the pain.

Case 7.—Mrs. F., æt. 42, mother of a large family, has been for years a martyr to sciatica ; in May last she consulted me about it, though she said she could scarcely hope for relief. I applied the continuous current to the same parts and with the same force as in the case last mentioned, and with the same result. In a few days, however, she came again, as the pain had recurred, and again she got immediate relief. Two days after this second application I gave her a third, and since then she has been quite free from pain.

Headaches.—No one who has not tested for himself the value of electricity in various kinds of headaches can form even a proximate estimate of the relief that it constantly affords. Its beneficial effects are most apparent in those aggravated and persistent attacks of headache which have resisted all ordinary treatment. Hemicrania or sick headache is specially amenable to the continuous current; a few gentle applications, and in some instances one application from two to four cells of Stöhrer's continuous-current battery, the sponges being applied to the temples or mastoid processes for two or three minutes, will *effectually give relief.* I refer as an illustration of the effect of electricity

in relieving headaches to the following case, not only on account of the severity of the headache, but because in it marked relief was afforded to intense pain in the eyes and intolerance of light (photophobia), symptoms of the glaucomatous affection that existed in them. Photophobia is relieved by the continuous current not only when it results, as in this case, from glaucomatous disease, but also from its more constant cause, ulceration of the cornea.

Case 8.—*Intense headache, pain in the eyes, and photophobia relieved by the continuous current.*—A married lady sent for me in consequence of the pain she was suffering in the head and back of the eyes; the pain she described as terrible, and "as if something was being bored through the temples." She said her eyes felt as if they would "crack," and she could not bear the light. This lady, three weeks previously, had consulted me about her eyes, and the rapidly increasing loss of sight which she latterly noticed had been coming on. Ophthalmoscopic examination then revealed far-advanced glaucomatous excavation of the optic disc of one eye; the dilated retinal veins characteristically curving over the cupped edges of the disc. Atrophic changes were apparent in the other eye. With a view to ascertaining the advisability of submitting to iridectomy, I advised this lady to consult an eminent oculist. Weeks, however, elapsed, and when I now saw her she was prostrate with pain. Finding the morning after my visit that no relief had been obtained by the remedies I had prescribed, I applied the continuous current, using four cells, the sponges being applied to the temples and also to the mastoid processes, and the application lasting four minutes. At the expiration of half an hour after this application my patient said that the pain in the head was quite gone at the right side, and much less at the left, but the pain in the back of the eyes was still severe. I then applied the moistened sponges to the closed lids of either eye and the corresponding temple, the application for each side lasting two minutes. She was greatly relieved by this, and in the evening told me that the pain was very slight, more like stiffness than pain, but that the tight feeling in the eyes continued. That night she took pot. bromid. 10 grs., chloral 15 grains.

The next day I found the right side of the head and right eye were perfectly free from pain, but there was a heavy painful feeling in the left. Most complete relief was then afforded by another application, and the photophobia disappeared. The pain having in a degree recurred during the night, I applied the galvanism again next day, affording immediate relief.

Rheumatism.—In the treatment of local rheumatism no remedy has more decided and permanent effect in relieving pain than the judicious application of electricity. The relief afforded by the subcutaneous injection of morphia is too often only temporary, while ordinary medicinal treatment most frequently altogether fails. In using electricity for muscular rheumatism, I have found that a combination of galvanism and Faradisation is the most certain mode of securing relief from the pain. In many cases I found that the induced current alone did not ease the pain; but if applied after a longer or shorter course of galvanism, its beneficial effects were at once apparent; while in many cases galvanism failed to give relief till the induced current had been subsequently applied.

Myalgia.—It is important to distinguish between myalgia and muscular rheumatism; Dr. Inman, of Liverpool, has drawn attention to the subject, and has described a train of symptoms sufficiently distinctive and well marked in the following case.

Case 12.—*Myalgia of months' duration cured by six applications of continuous current.*—Mrs. B., æt. 52, came under my care in May last; she had been for some months attended by a homœopathic druggist for bronchitis (?); when I saw her she was reduced to such an enfeebled state that she could not walk without support on either side; the body appeared exsanguinated; she was reduced to a skeleton, and general debility was extreme; decided asthma was present, and well-marked emphysema of both lungs. For weeks past she had not slept; unable to lie down, owing to the difficulty of *breathing, she* spent the night in trying to move about her room, as she fancied *that by doing* so she got some relief from the burning pain which tormented

her in the back of the neck whenever she attempted to sit still. In the arms and legs she constantly suffered from severe cramps. She had been taking antimony, and had been kept on low diet. Quinine, iron tonics, good nutriment, wine, and rest procured with chloral and bromide, did much to restore her strength, but the pain in the neck resisted all the liniments I could think of—chloroform, belladonna, aconite, &c.; this always returned with renewed force when she had been up for a few hours. As soon as she had gained sufficient strength to come to my house, I applied the continuous current, from first four and finally eight cells; I applied it altogether six times. The pain always left immediately after each application, though at first it returned towards night; but after the fifth and final application it did not recur. I have just heard from the friends of this lady that since that time her health has steadily improved, and that there has been no return of the pain in the neck; moreover, and this is a significant fact, there has been considerable relief to the breathing, and she has not since then had an asthmatic attack.

Diseases of the Digestive Organs.—Of all painful diseases, there are none in which the relief afforded by electricity is more constant and striking than in diseases of the digestive system. In obstinate cases of vomiting, constipation, dyspepsia, flatulency, persistent hiccough, gastrodynia, acid eructations, &c., I have found both galvanism and Faradisation of great value, and in many cases after years of suffering had been endured. The following cases are selected from a large number, because in them actual pain was the most prominent symptom and the one for which relief was sought.

Painful Dyspepsia.—Case 13.*—Pain in stomach and bowels, vomiting, flatulency of seven years' standing, cured by the continuous current.*—Mr.——, æt. 65, for seven years had been a martyr to pain in the stomach and bowels; the pain was always increased by taking food, and was only relieved by vomiting or the discharge of quantities of gas by the mouth; there was obstinate constipation, which had to be overcome by strong purgatives; the paroxysms of pain were at times so intense that the man has been "thrown down in an agony," and on one occasion, his employers believing that he was intoxicated, very narrowly escaped rough treatment. He was very temperate, and his diet was very limited; he had learned to avoid those articles which increased his discomfort. Of medicine he had certainly taken his share; his occupation compelling him to change his residence occasionally, he had the benefit of much and varied medical skill; indeed, he said that for seven years he had never been out of the doctor's hands. I prescribed Friedrichshall water to be taken in the morning, and Val's water with a little brandy to be taken during the day. I at once began by galvanising the bowels, applying the positive pole to the rectum, and passing the other sponge from spot to spot over the whole of the abdominal walls, and using a considerable amount of pressure. I began with twelve, and ended with thirty cells, and each application lasted five minutes. As the sponge was passed along the track of the colon, the motion of the wind was apparent, and the noise distinct; I also galvanised the stomach itself, by pressing the negative pole on the cardiac end, and passing the second sponge with deep pressure towards the pylorus. This treatment I continued for six weeks, two applications each week. After the first application the pain was never severe, and vomiting never occurred; at the end of the third week wind was freely passed by the rectum, and the Friedrichshall was quite sufficient to produce a comfortable daily stool. When I discontinued the galvanism there had been no pain whatever for several days, and a month after he visited me, saying he was a new man, and that his object in coming was to obtain leave to extend his dietary. I saw this patient again to-day, Nov. 29th, and his report is in every way satisfactory; his morning draught of Friedrichshall is his only physic; the pain has never returned.

Case 14.*—Dyspepsia, pain in stomach and flatulent distension of bowels, relieved by continuous current and Faradisation.*—Mrs. ——, about 45 years of age, and mother of several children, had for years been a great sufferer from pain in the stomach and bowels, which was always worse after taking food; *there was a great* flatulency and distension of the stomach, caus-

ing at times distressing irregularity of the heart's action. The abdominal parietes were very weak, and the bowels were extremely constipated, owing to the feeble peristaltic actions of the intestines. This lady was so circumstanced that she had had the advantage of the very best medical advice that could be procured, but any relief she got was only temporary, and when she consulted me looked on any cure for her sufferings as hopeless. I suggested electricity, which was readily assented to, but the accompanying gentle medical treatment which I prescribed was obstinately resisted. I galvanised the stomach and bowels, applying the sponges in the same manner as in Case 10, and using from eighteen to twenty-six cells. After five applications the relief to the pain was complete and permanent, but subsequently I Faradised the abdominal muscles with marked benefit. I have recently seen this lady, and she says that, remembering how long and wearily she suffered, she looks on the effect of the brief galvanic treatment I had subjected her to as something miraculous.

Case 15.—*Flatulency and painful dyspepsia relieved by the continuous current.*—Mrs. ——, æt. 59, a corpulent woman, and mother of a large family, consulted me on account of pain in the stomach to which she had been subject for years; flatulence was also very painful and distressing, and she constantly vomited quantities of watery fluid. Her diet was restricted to a few articles of the simplest nature, and the quantity of food she took was extremely small, and to this she attributes the great weakness of which she complained; when I first saw her she was able to walk but very short distances. The bowels were constipated, and wind seldom passed by the rectum. She had taken quantities of medicine, charcoal, bismuth, pepsine, &c., but nothing gave her relief. I prescribed Pullna water to be taken in the morning and Vichy during the day, and galvanised the stomach and bowels; she was obliged to leave Blackpool for a time, but returned, and I continued the treatment. I applied the continuous current, using twenty cells, altogether eight times, and subsequently Faradised the relaxed abdominal muscles several times till her strength was restored. When this lady left for her home she could eat heartily with comfort and relish, take long walks, and had been for some time free from pain.—*Liverpool and Manchester Med. and Surg. Reports*, 1876, *p.* 164.*

19.—ON PSEUDO-HYPERTROPHIC PARALYSIS (OF DUCHENNE).

By Dr. William H. Barlow, Honorary Medical Officer, General Hospital and Dispensary for Sick Children, Manchester.

The interesting and curious disease which forms the subject of my paper was first described by Dr. Duchenne (de Boulogne) in the year 1861, in the second edition of his admirable work on "Localised Electricity," published in Paris in that year. As he himself relates ("Archives Générales de Méd.," 1868), the discovery of this affection dates from the year 1858, when a child, which had been struck with a paralysis of an unaccustomed form, was sent to his civil clinique by his friend M. Bouvier. "Having collected," he goes on to say, "in three years certain facts absolutely similar, and to which I did not know anything analogous in science, I believed myself entitled to consider that muscular affection as a morbid species not yet described and peculiar to infancy."

The name first given to this disease by Duchenne was "Paraplégie hypertrophique de l'enfance, de cause cérébrale;" he has, however, since then found cause to alter his opinion, and is content now with the name he places at the head of this treatise in the "Archives Générales de Médecine." Jaccoud calls it, and with him agree most English and American writers, "Sclérose musculaire progressive," after Requin, progressive muscular

* *[For electric batteries of all kinds we can recommend Mr. Elliott, of Leighton Lane, Leeds, who makes them well, and at a very moderate cost.—Eds.]*

sclerosis. Heller proposed to call it "Lipomatosis musculorum luxurians," and many other names have been proposed by various writers; but the two which I have used in the title of this paper seem to me to be the best and most descriptive, the former of the prominent and striking feature to the outward observer, and the latter of the pathological muscular change.

Symptoms.—The principal morbid phenomena are, as Dr. Duchenne gives them—

1st. In the beginning, feebleness of the lower limbs.

2nd. Lateral balancings of the trunk and widening of the legs during walking.

3rd. A peculiar curvature of the spine (ensellure), or saddle-back (lordosis), both in walking and standing.

4th. Equinism (talipes equinus), with a peculiar over-extension of the first phalanges of the toes, which Duchenne calls "griffe des orteils."

5th. Apparent muscular hypertrophy.

6th. Stationary condition.

7th. Generalisation and aggravation of the paralysis.

When the disease has arrived at the stage of apparent hypertrophy, the appearance of the patient is very characteristic, and its true nature would be at once obvious to any one who had any knowledge of its symptoms; but in the earlier stages there is but little to guide us to a diagnosis unless we have some hereditary history. Of the hereditary nature of this affection the published cases give ample proof.

The children are at birth apparently strong and healthy, and it is not until they arrive at the age of twelve or fourteen months that anything is noticed. At that period it is found that when they are placed upon their feet they fall down, or clutch at the nearest object to support themselves; or in other cases it may be that the child has commenced to walk, when without pain or fever, or sometimes after convulsions, it is found to be soon fatigued, either by walking or standing, and at length it can no longer walk or hold itself upright; or again, it may be that the child does not walk until very late, 2½ or 3 years, and then very feebly and imperfectly. In one of my own cases the child did not begin to walk until 2 years old, and then but very badly, and would hold on by the chairs or any object within reach, and in another it had never walked well, but, as the mother said, "always walked wide and so dropped down."

These defects in movement do not excite so much attention among the class from which hospital cases are usually taken, as the limbs are apparently well developed, and they are constantly hoping to see the child recover from what they imagine to be a temporary infirmity. When the child so falls, it raises itself by the aid of the nearest article of furniture or other object that it can reach, or if none be within reach then in a very peculiar and characteristic manner. When the body falls forward these children apply their hands successively to the legs and thighs and so as it were push the body upwards, and when attempting to mount the stairs they drag the body upwards by the arms. The mode of progression is by a waddling "duck-like" movement ("dandinement"), alternate balancing of the body on the leg which is applied to the ground. The equilibrium is always unstable, both when walking or standing, and a slight force will cause the patient to fall "all of a heap;" in the case reported by Dr. Foster the boy had to be removed from school because the other boys would push him over in order to see "his grotesque and futile efforts to raise himself." In the efforts to walk or in standing alone the feet are widely separated.

"It is true," says Duchenne, "that lateral balancings of the trunk are observed also in the child who begins to walk normally, but they are not very manifest and soon disappear, whereas in the disease I describe they increased and continued during the disease. I have never seen this symptom in children attacked with other paralyses, and look upon it as one of the principal characteristics of the pseudo-hypertrophic paralysis." This peculiar gait and station he attributes to feebleness of the middle and small gluteii ("fessiers"). As the case advances it is found that the child has a difficulty in bringing *the heels to the ground*; there is a condition of talipes equinus or

equino-varus, and the toes are in a state of exaggerated extension upon the metatarsal bones; this condition of course increases the difficulty and peculiarity of gait. Before this latter condition becomes very marked, another and more striking characteristic becomes developed, in the form of a peculiar curvature of the spine, so that the shoulders and upper portion of the vertebral column are carried backwards until a plumbline, falling from the most prominent of the spinous processes, falls quite clear of the sacrum. This produces a deep curvature in the lumbar sacral region, a condition which Duchenne calls "ensellure," or, in English, saddle-back, and is due, he thinks, to weakness of the extensors of the spine, and is one of the most constant symptoms of the disease in question. In his monograph he gives plates contrasting this condition with that of the curvature produced by unopposed action of the spinal muscles, as in paralysis of the abdominal walls, where the curvature is at first glance somewhat similar, but the plumbline falls well within the line of the sacrum. (In the plates which accompany this the children are not standing alone, and therefore this is not so perceptible as it would otherwise be.)

The next symptom to appear is the one which is at once the great distinction and marked peculiarity of this affection—the apparent hypertrophy of the muscles. Its appearance is very gradual, but when the cases have advanced to the full development, the little patient may, as one of the cases pictured by Duchenne does, present the appearance of an infant Hercules. In most cases the calves and the buttocks are the chief seats of its manifestation, but in some, notably in the one just mentioned, it may affect other muscles. Says Duchenne, speaking of this case, "with the exception of the pectorals, of the great dorsal, and of the sterno-mastoids, it had invaded all the muscles of the limbs, of the trunk, and even those of the face, especially the temporals" (see figs. 3, 4, 11, "Archives Gén. de Méd.," 1868). The muscles stand out so prominently under the skin that Duchenne uses the term "hernial protrusion" to describe their appearance. There is nothing more astonishing upon first sight than this curious contrast between the exaggerated appearance of muscular strength and the marked feebleness which is the reality. The unaffected muscles are usually meagre and feeble, but the degree of impairment does not always coincide with that of enlargement; nor does every enfeebled muscle increase in volume. "I have seen," says Duchenne, "subjects in whom the feebleness of the muscles was more or less generalised, almost from the commencement, but where the hypertrophy was limited to the muscles of the buttocks and the lumbo-spinals." This condition of apparent hypertrophy continues generally for a much longer period than the group of symptoms previously narrated; and it forms the second or stationary period of Duchenne, which continues advancing very gradually and almost imperceptibly, during two or three years, sometimes more (see Duchenne, "Electrisation Localisée," 3rd ed., p. 606, Paris, 1872). It does not necessarily begin in the lower extremities, though it generally does so, and extends gradually from these to others, and becomes localised in certain among a number of equally enfeebled muscles. "In one of my observations," says our author, "the deltoids had commenced to augment in volume many months before the gastrocnemii" (loc. cit. supra).

The people in charge of the patient in this stage, whether parents or nurses, are deceived by the false appearance of good development; and although they see the weakness and failure of muscular power, hope constantly for improvement—a hope which is seldom dissipated until the case enters after a more or less protracted period, upon the third and last stage of the disease.

In the preceding period there has been but little, if any, extension of the paralysis: the progress has been marked rather by increase in the volume of the affected muscles, than by changes in innervation. But this is now no longer so; the enfeeblement of the lower limbs increases until the patients can no longer carry themselves upright; the upper limbs become paralysed, "à leur tour en masse;" and unlike those attacked in the earlier stages, they do not increase in size; on the contrary, both these and those previously enlarged now rapidly diminish, and some of them become atrophied. Elevation of the arms becomes impossible, and the affected muscles lose gradually

all that remains of motility, until the poor child, then generally arrived at adolescence, can only remain seated or recumbent. This condition may last for a considerable time. "Pseudo-hypertrophic paralysis," continues Duchenne, "is an apyretic malady in which the functions which preside over digestion, respiration, and circulation, are accomplished normally. The little patients may live a long time yet; at last they fall into a condition of great weakness, and are rapidly carried off by some intercurrent malady."

In one case the muscles were profoundly altered and presented to the touch the sensation of a pasty mass, non-elastic, and were traversed by yellowish striæ of a whitish-yellow tissue, showed everywhere a greasy reflection when cut. The electro-contractility was normal, and nothing was noticed in the nervous or vascular system differing from the normal. The patient was a boy of thirteen years. Duchenne himself denies that the surrounding fibroid interstitial tissue is composed of empty sarcolemmæ ("Electrisation Localisée," Paris, 1872, 3rd ed., p. 604), and in my own case there were certainly no such appearances.

The waxy fibres which surround the muscular fibres, and which contain a considerable quantity of ordinary adipose tissue (not oil-globules, but fat-cells), he looks upon as an increase of the ordinary connective tissue of the part, due to changes in the nutritive force, but the appearances are perhaps best given in his own words; he says ("Electrisation Localisée," 3rd ed., p. 603)—

"1. The hyperplasia of the interstitial connective tissue, with production of a more or less abundant fibroid tissue, is the fundamental anatomical lesion in pseudo-hypertrophic paralysis."

"2. It has its seat in all the paralysed muscles as soon as they commence to increase in volume, and this it is which justifies the anatomical denomination of myo-sclerosic paralysis, which I have proposed to give to it, and, with regard to its symptomatologic denomination, the pseudo-hypertrophic paralysis."

"3. This it is which produces the considerable augmentation of volume of the muscles, by reason direct of the increased (hyperplasié) quantity of interstitial fibroid and connective tissue."

"4. The increased (hyperplasié) connective and fibroid tissue is ordinarily mixed, or united to a small or mean quantity of adipose vesicles; indeed (ou bien), according to the facts observed in Germany, it is replaced by a considerable quantity of these adipose vesicles. This last condition appears to me to be the most advanced degree of the interstitial muscular tissue in the pseudo-hypertrophic paralysis."

"5. From my personal observations the transverse striation is preserved in all the length of the most part of the muscular fibres, but it becomes extremely fine and very little apparent. In the parts where the transverse striation has disappeared, we see the longitudinal striæ; some of these longitudinal striæ are themselves effaced, the sarcolemmæ seem to contain adipose vesicles, which in reality proceed from the surrounding interstitial tissue, and which, moreover, differ from the characteristic fatty granulations of fatty muscular degeneration."

"6. The hyperplasia of the interstitial connective tissue does not appear in general until the second period of the malady; it seems to me to be preceded by an inflammatory state of the muscles, which may also occasion a slight augmentation of their volume. In this period (first period of the disease) the transverse striation is often of an extreme tenuity."

Duchenne believes that the paralysis is due to a lesion of the vaso-motor system, and calls to witness the alterations of capillary circulation and temperature, though no lesion of the ganglionic system has been as yet demonstrated.

As to the prognosis, the general opinion may be stated to be that in the first stage, before the muscles begin to enlarge, the prognosis, though grave, is not fatal; but that with the second period (that of enlargement) that hope leaves us; and still more is this so in the third or period of atrophy and debility.

The treatment includes the usual hygienic measures—baths, frictions, and

shampooing, the iodides of iron, of potassium, strychnia, or nux-vomica, and where there are cerebral symptoms the bromide of potassium has been found very useful. Tonics are indicated, arsenic, cod-liver oil, and Parrish's chemical food (the compound syrup of phosphaes), have also been used with benefit, and probably free phosphorus in some of its therapeutic forms might be of value. But of all means within our power, the most promising is the prolonged and careful use of electricity in the forms of the induced and the galvanic current. I have myself used both forms on the same patient, and although both my patients, being out-patients, are rather irregular in their attendance, yet I believe that I can see some improvement. The instruments used are Stöhrer's batteries, and I have not used more than six cells of the constant battery, and his battery with one cell, for the induced current.—*Liverpool and Manchester Med. and Surg. Reports*, 1876, *p.* 1.

20.—ON SLEEPLESSNESS.

By Dr. J. Miller Fothergill, Assistant Physician to to West London Hospital.

[After reviewing the different forms of sleeplessness, Dr. Fothergill passes on to consider the chief forms of hypnotics in common use.]

To take opium first. Its use is rather indicated in conditions of insomnia which take their origin in pain. When there is vascular excitement present, it is desirable to combine with it direct depressants of the circulation, as aconite or antimony. The subsequent cerebral anæmia induced by the resort to opium is not so pronounced as is that induced by chloral.

Hyoscyamus takes its place alongside of opium, and may be resorted to in cases where opium or morphia disagrees, as in cases of chronic renal disease. For this last class of patients the tincture of hop is often very serviceable, though now rarely prescribed; it is a very satisfactory agent in such cases.

Hydrate of chloral is comparatively valueless in sleeplessness due to pain, and is inferior, in this respect, it is said, to the croton-chloral-hydrate. It is, however, very useful in conditions of vascular excitement, either alone, or in combination with opium. In the delirium of acute pyrexia in children it may be usefully combined with the bromide of potassium. In cases of sleeplessness where there is a sustained high blood pressure, or where there is distinct pyrexia, chloral hydrate is the hypnotic *par excellence*. It is, however, decidedly to be avoided in cases where the inability to sleep is due to worry and to brain exhaustion. In such cases, as in melancholia, the cerebral anæmia which follows its use is most objectionable and mischievous. It amounts to "brain-starvation," in fact, and the persons so affected are reduced to a pitiable condition. The persistent resort to chloral-hydrate is most disastrous in its consequences, and the temporary relief afforded by it is not to be set against its after effects.

Bromide of potassium has a decidedly sedative effect upon the brain cells; and the cerebral anæmia produced by its administration is rather due to its sedative action upon the cerebral cells, by which they attract less blood to themselves, than to its effects upon the circulation; though doubtless to some extent it does diminish the activity of the heart. Its special advantage lies in its utility, where cerebral activity is kept up by far away peripheral irritation, especially when that irritation lies in the pelvic viscera. It may be given alone, or with opium, or with chloral, according to circumstances; and may often be usefully combined with hyoscyamus in cases where opium is contra-indicated. Its constant use, however, leads to diminished brain activity, and to intellectual lethargy.

Chloroform is a most potent agent, and is rarely resorted to as an hypnotic *until other means* of attaining the desired end have failed. The dangers *attendant upon* its use are so great that it is only resorted to in dire necessity.

It is, however, occasionally used as a narcotic by the profession, but more frequently by persons upon their own responsibility. This chiefly occurs in those subject to sudden and unendurable pain, when nothing but the narcosis of chloroform would be effective. Probably indeed in these cases, all other and less objectionable means of attaining relief have been tried and have failed. According to Claude Bernard, by combining opium, or rather morphia with chloroform, the sensory nerves and centres are affected ere the intelligence and the motor powers are much influenced. But with chloroform alone all are equally and alike affected. The danger of chloroform inhalation lies chiefly in the risk of an overdose being taken; as unconsciousness creeps on the motor power is involved, and then the amount taken may be, and too often is, far beyond what was intended. In another communication in the Practitioner will be found some account of a most ingenious apparatus, by which the supply of chloroform is cut off as soon as the motor power is impaired. If resort to chloroform inhalation cannot be avoided by certain sufferers, surely it is not objectionable from any point of view that the danger attendant thereupon be reduced to a minimum.

There is another hypnotic agent of undoubted potency, which cannot be overlooked in the present inquiry, and that is—alcohol. If there be any use of alcohol that is free from objection it is its use as a narcotic in certain conditions. With many persons a dose of alcohol at bedtime is the very best nightcap they could possibly resort to. The cases best adapted to its use are those where there is mental worry and anxiety. In such states the first effect of alcohol in removing gloom and substituting pleasing sensations for unpleasant thoughts is eminently useful. A series of pleasant mental images are brought up on the mental horizon by its means, in place of the *triste* and sombre subjects which before its use occupied the foreground of the consciousness; and with such agreeable objects uppermost, the secondary effects come on, and the patient is wrapt in a refreshing renovating sleep. Probably the evil after effects of alcohol, so used, are less than those of any other agent which would achieve the same end. Unfortunately, however, commonly the very persons for whom alcohol would form the best hypnotic are those most opposed to its use; and where a full dose of alcohol would constitute the best remedy that could be resorted to, prejudice prevents its employment.

So much for the ordinary narcotic agents in common use.—*Practitioner*, *Feb.* 1876, *p.* 113.

21.—ON THE APPEARANCE OF PARALYSIS ON THE SIDE OF A LESION IN THE BRAIN.

By Dr. C. E. Brown-Sequard, F.R.S.

Since the time of Misticnelli's discovery (in 1709) of the decussation of the anterior pyramids of the medulla oblongata, it has been universally admitted that one lateral half of the brain is the centre, or contains the centres, for the voluntary movements in the half of the body on the opposite side. Very strong—I may say decisive—arguments can be arrayed against this theory. On the one hand, either the anterior, the middle, or the posterior lobes of the brain, or a great part, or very nearly the whole of one hemisphere, or also a very great part of a lateral half of the pons Varolii or of the medulla oblongata, can be destroyed without paralysis; while, on the other hand, a paralysis may appear in one limb, or in both upper or both lower limbs, when the lesion is only in one lateral half of the brain. In other cases, and this is the principal object of this lecture, a paralysis may appear in one or in both limbs on the side of the lesion of the brain. If the universally admitted theory were true, most, or at least many, of the above-mentioned facts could not have existed; and if the new views first originated by Fritsch and Hitzig were true—if, in other words, special centres existed, one for the movements of the arm, one for those of the leg, many of the above-mentioned *facts could also* not have existed.

What I have just said of centres can be said of conductors also. If the conductors for the voluntary movements of the limbs on one side pass through the other side of the crura cerebri, the pons Varolii, and the medulla oblongata, a deep alteration, or a destruction, of a great part of one-half of these organs would *always* be followed by a paralysis of the limbs on the other side. It is far from being *always* so.

The same thing may be said of the face and the tongue. A lesion in one half of the brain above the pons Varolii can produce a paralysis of the face or tongue, either in the corresponding or in the opposite side, and there is no relation between the intensity and extent of the facial or lingual paralysis, and the degree, the seat, or the extent of the disease.

On the one hand, therefore, there is not *always* what we should find were the universally received theory quite true; and, on the other hand, there are a great many facts in absolute opposition to the theory, as regards not only the movements of the limbs, but also those of the face and the tongue.

That this theory must be rejected is not, however, the only necessary conclusion from the facts, the existence of which I assert; another conclusion also issues forcibly from these facts. It is that one half of the brain is sufficient for the movements of the two sides of the body. It is not without the greatest reluctance that I have come to admit the correctness of this last view—reluctance assuredly well grounded in a practitioner seeing every day cases of paralysis occurring in the limbs, the face, or the tongue on the side opposite to that of the lesion in the brain. I need not say that I felt at once that to put down the old theory and to replace it by mine, it was not sufficient to have facts against the universally admitted doctrine; it was essential also to explain how paralysis can appear indifferently in one or in the other half of the body from a lesion in the same part of the brain.

In the actual state of science the cases of paralysis on the side of the lesion of the brain are looked upon with very dubious eyes. Dr. James Copland denies almost absolutely that there are such cases. He states that the lesion found may have existed without producing paralysis, and that the paralysis that was observed may have had its cause in a lesion in the opposite side of the brain, not found after death. I do not doubt the possibility, even the probability, that it was so in some cases, but I will prove that, at least sometimes, the brain-lesion found on the side of a paralysis was the real cause of that loss of voluntary movement.

Before examining clinical facts, I will say that experiments on animals have given me this unforeseen result, that *a paralysis on the side injured always follows certain injuries of the surface of the brain.* The lesion which has the greatest power to produce this direct paralysis consists in a burn of a part of the surface of one hemisphere of the brain. The anterior, the middle, and the posterior lobes possess the power of generating that paralysis, but the two last parts more than the first. The deep-seated parts of the brain— *i.e.*, the walls of the lateral ventricles, the corpus striatum, the optic thalamus—have also that power. The paralysis so produced is very slight, and it is variable as regards its seat: it usually exists in one of the limbs on the side of the lesion, sometimes in both; it also appears sometimes in the abdomen, the thorax, the face, the neck, the bladder. If the burn of the surface of the brain is deep, and very extensive, it produces sometimes a considerable paralysis in the four limbs, more intense in the two abdominal limbs, or in the two thoracic limbs, and greater, in those instances, in the limbs on the opposite side than in those on the side of the brain-lesion.

The irritation due to a burn of the surface of the brain in rabbits, guinea-pigs, cats, and dogs, is not the only cause able to produce a paralysis on the side of a brain-lesion. Long ago Méhée de la Touche found that a transverse section of certain parts of a lateral half of the brain or of the cerebellum in dogs is sometimes followed by a paralysis on the same side. I have seen the same thing, but very rarely, and the paralysis has been less than that which was seen by the surgeon just named.

If a paralysis appears in dogs and other animals on the side of a lesion of *the brain,* we certainly can look upon the same thing as possible in man;

nay, there is a probability that it sometimes exists. This being stated, let us see what are the facts observed in man in which a paralysis has, or seems to have, existed on the side of the brain-lesion. I may startle many of my hearers in stating that I have collected *more than two hundred* of such cases. Burdach, out of 258 cases of paralysis in one half of the body, states that there were 15 on the side and 243 on the opposite side of a lesion in the brain. W. Nasse, besides the 15 cases of Burdach, knew of 26 cases of paralysis on the injured side in the brain. In two good papers on the subject by Bayle and Dechambre, not more than 10 or 12 cases are pointed out. The 200 I have collected do not include those of Nasse's list (at least most of them), as I have not been able to procure the paper of that learned physician. But it is not the number of such cases that can alone carry conviction. The features of certain cases, or some peculiarity attached to them, will do much more to prove that the paralysis was really due to a lesion on the side of its appearance. The demonstration is, I believe, fully given by the following facts and arguments:—

1st. In a case in which a small bullet (a pistol shot) passed through the whole *right* side of the brain from back to front in the upper part, and at a distance of an inch from the middle line in the occipital bone, and one-third of an inch in the frontal bone, there was at once a paralysis on the same side (the *right*). Eight months after, the paralysis was not quite cured. The case has been reported with great care by two Belgian physicians, Dr. Liévens and Demoor. It is impossible to admit that there was anything here but a lesion of the three lobes of the right side of the brain in parts where there is no large bloodvessel and above the lateral ventricle, so that no great effusion of blood can have taken place, and the effused blood cannot have passed from one ventricle into the other.

In a case in which a large mass of medullary cancer involving the *left* parietal bone had made its way outwardly, a pressure upon the tumour "caused temporary loss of power of motion in the *left* arm—that is, the arm of the affected side." Mr. George W. Callender, who published this case, has supposed that in cases of paralysis on the side of a lesion in the brain there was a pressure exerted on the opposite side, the paralysis resulting from this pressure. In this case it is clear that a pressure on the tumour, if able at all to act on the right side of the brain, must necessarily have spent almost all its force on the left side, so that the temporary paralysis was evidently due to a lesion on the same side as that where it occurred.

In a very interesting case, published by Scholz, of Bremen, a patient was attacked with aphasia, drooping of the *left* upper eyelid, and *left* hemiplegia, and was cured after the issuing of a good deal of pus from inside the cranium, through an opening, on the *left* side of the head at nine centimetres below the sagittal suture and on the coronal suture. An effort has been made to explain this case in admitting that the pressure exerted by the intracranial abscess had produced œdema and anæmia in the opposite side of the brain. It seems wonderful to me that such an idea can have, even for a moment, come to the mind of a surgeon of merit! Is it necessary to show that if the abscess was located near the place of exit of pus it is the left half of the brain alone, or nearly so, which bore the pressure, and that if œdema and anæmia resulted from that pressure, it was in the left half of the brain that they occurred?

In another case it was clear also that the paralysis originated from a lesion on the corresponding side of the brain, as it came in the *right* limbs after a blow on the forehead and the temple on the *right* side; and the autopsy showed that the *right* parietal bone was perforated, and there was a large abscess over the *right* hemisphere.

In all the above cases the knowledge during life of a lesion on the side of the paralysis existed, and the connexion between the lesion and the paralysis was so obvious that it seems to me impossible that anyone giving time to the examination of these cases can suppose that an *unseen lesion* in the hemisphere of the brain on the opposite side to that of the paralysis was the real cause of this loss of movement.

Dr. Swayne Little, according to Gintrac, has reported the case of a patient

whose *left* side became paralysed after having had the *left* anterior lobe of his brain pierced by an iron spit.

Abercrombie gives a case of Hill, in which, after two months, during which there had been vomiting, headache, and numbness in the *left* hand, the whole *left* side became paralytic. After another month a small tumour appeared by the side of the bregma, which discharged matter with some relief. Seven months later Mr. Hill found an opening in the *left* parietal bone, and, having applied the trephine there, he discovered an abscess, which discharged four ounces of matter. There was much relief after that discharge, but protrusion of the brain took place, and the patient died. The brain was found destroyed by suppuration two inches around the opening of the skull. In this case it is clear that the paralysis depended on the abscess, as it increased with it, and it diminished twice after the issue of matter.

J. Lafargue gives a case of fracture of the *left* parietal bone, followed by *left* hemiplegia. Near the fracture the cerebral substance was found reduced to a brown-greyish pulp (*detritus*); this colour, becoming bluish, extended to the centrum ovale. The right hemisphere was perfectly normal. There can be very little if any doubt that in this case the cause of the paralysis of the left side was in the left half of the brain.

2nd. The second reason I will give to prove that a paralysis may be caused by a lesion in the same side of the brain is drawn from cases in which there were symptoms of hemorrhage in the brain at the time that a paralysis appeared, and in which no hemorrhage in that organ was found after death except on the side of the paralysis.

Diday, a very accurate observer, relates that a woman lost consciousness suddenly and completely, and when she recovered her senses her right limbs were paralysed. For five years she remained incompletely paralysed (of the *right* limbs and *right* side of the face). She died of heart disease, and the autopsy showed no disease in any part of the brain, except in the *right* side. An old cyst replaced the right corpus striatum, and the neighbouring white radiations. In the *right* posterior lobe there was a very small yellow cicatrix.

Degranges, quoted by Gintrac, gives the case of a girl who was attacked with vomiting, coma, paralysis of the *right* limbs and convulsions, then spasmodic contraction of the same limbs. In the centre of the *right* posterior lobe a small clot was found surrounded by a yellow soft pulp, with red punctuations.

Mr. G. W. Callender gives a case of sudden paralysis of the *right* side, followed by death in nine hours. A recent clot, the size of a walnut, was found in the *right* hemisphere. Thence the blood, passing through the corpus striatum, had entered the various ventricles.

A very interesting case, with considerable details, is given by Hillairet, a distinguished physician of Paris. The patient had several attacks of hemorrhage of the brain, all in the right half; the *right* posterior lobe was almost destroyed, and the *right* optic thalamus was notably atrophied. The paralysis was on the *right* side.

In a well-recorded case, Gintrac states that a patient became paralysed of the whole *left* side, face included, after an attack of apoplexy. There was a closure of the *left* eye, and diminution of feeling in the *left* arm. Between the corpus striatum and the optic thalamus on the *left* side, and the cerebral substance on the external part of the organs, there was a cavity three inches in length, one inch in height, and as much in width, containing a clot of blood.

There are on record a number of other cases of apoplexy with hemiplegia on the side of the cerebral hemorrhage. I will only name the authors who have published such cases:—Morgagni, Brunner, Lerminier, Dr. R. Boyd, Rostan, Albi.

It is clear that when we find hemiplegia appearing together with apoplectic symptoms, we must admit that the only lesion found, and consisting in evidence of fresh or old laceration of brain-tissue by effused blood, is the cause of the paralysis; and if, as in the above cases, the loss of motor power appears on the side of the brain lesion, it is evident that in those cases the ex-

planation that that kind of hemiplegia depends on an *unseen* lesion in the opposite side of the brain must be rejected.

3rd. In a number of cases of paralysis on the side of the only lesion found in the brain there was aphasia coexisting with left hemiplegia, the left side of the brain being the seat of the only organic alteration found after death. Such is what was found in the following cases. One of Professor J. Syme, in which there was fracture of the cranium, with very considerable serous effusion pressing over the *left* middle lobe, which was much altered ; this lesion producing aphasia and paralysis of the *left* side. Another of Cruveilhier, in which a great part of the *left* anterior lobe was hardened and red, paralysis of the *left* side and loss of speech being the symptoms. A third of Bayle, in which there was disease of the meninges and the convolutions and white substance of the anterior lobe on the *left* side, with aphasia and paralysis of the *left* limbs.

Unless we admit either that the aphasia alone depended on the lesion found in the left side of the brain and the paralysis on a supposed but unseen lesion of the right side of the brain, or that both the aphasia and the paralysis did not depend on the only organic alteration found in the left half of the brain, but on another lesion not found, but supposed to exist in the right half—two equally improbable explanations,—we must accept as correct that paralysis in those cases was caused by a lesion in the corresponding side of the brain.

4th. The extent of the lesion is also a strong argument in favour of the view that in some cases of paralysis on the side of the organic alteration in the brain the cause of this loss of movement was that alteration itself, and not a supposed but unseen one in the other half of the brain. Among cases of that kind I will briefly mention some, two of which—those of Dr. Henry Day, of Stafford, and Dr. Dechambre, of Paris—deserve special attention, on account of the great care with which the autopsy was conducted.

P. P. Broc relates that in the case of a woman who had lost the power of motion and feeling in the *left* limbs, remaining intelligent, the *left* hemisphere was reduced to a pulp (*bouillie*).

Freschi states that a woman who had once had a temporary paralysis of the *right* arm one day screamed out that her *right* arm and leg were dying away, after which she lost consciousness, and soon died. The left hemisphere was found perfectly healthy; the *right* was transformed into an enormous cavity containing a blackish clot and fluid blood.

Mr. G. W. Callender gives this case:—A male, after having been attacked with epilepsy, and then cured for five years, had a return of the fits, with *left*-sided paralysis. From front to back the entire *left* hemisphere above the level of the corpus callosum was one large abscess. A mere shell of soft brain-tissue separated it from the ventricles and from the surface.

Ch. Curtius speaks of a case of apoplexy, with paralysis of the *right* side, in which the whole *right* hemisphere was converted into a mucous substance, which came out like a thread when a knife was lifted up out of it.

Rostan, in a woman who had been suddenly attacked with a complete hemiplegia of the whole *left* side, found almost the whole *left* hemisphere in a state of pultaceous softening.

In an individual who had suddenly been attacked with complete paralysis of the limbs and face on the *left* side, Dr. Henry Day found that the *left* middle lobe from top to bottom, and including the corpus striatum, was completely softened and broken down almost into a pulp.

Dechambre, in a good paper on the subject of paralysis on the side of the lesion in the brain, gives all the details of a case in which a sudden paralysis, which soon became complete, with drooping of the upper eyelid, occurred in the *right* side. The autopsy showed no lesion in the left side of the brain, but there was considerable alteration of the *right* hemisphere. Many parts of the middle lobe were reduced to a reddish pulp, the corpus striatum was destroyed, and the softening occupied the centrum ovale and also parts below the lateral ventricle.

In the presence of such facts it seems to me almost impossible to maintain that the great lesion *found* at the autopsy of those seven patients had not

produced paralysis, and that the hemiplegia existing depended on an alteration not detected in the side of the brain which was declared healthy by the able men who made the autopsy.

5th. The location of a lesion in the brain may give also a strong argument in favour of the view that a paralysis can be produced by a lesion in the corresponding side of the brain. If we find, for instance, that simultaneously with a paralysis in one half of the body, symptoms appear which point to a certain part of the base of the brain as the seat of the disease, and if the autopsy confirms this diagnosis, it is almost certain that the paralysis was caused by the lesion found. I was able in two cases to diagnose the seat of the disease in cases of paralysis on the side of the lesion, and the autopsy showed that I was right.

In a very large number of cases paralysis has appeared on the side of the encephalic lesion, when it existed in or on the pons Varolii, the cerebellum, the crus cerebelli, the medulla oblongata, or other parts of the base of the brain. Indeed, *in cases of disease of the petrous bone or of the surface of the encephalon near that bone, paralysis, if it occurs at all, will appear as frequently on the side of the lesion as on the opposite side.* I will by and by discuss the question whether there are there nerve-fibres that have not yet made their decussation. All I wish now to impress on your mind is that those parts of the cerebro-spinal centres are very peculiar. They are so not only because they often give rise to paralysis on the side of the lesion, but also because they can be more injured than any part of the spinal cord—of which most of them are chiefly a continuation—without giving rise to symptoms, and because when injured in one of their halves there is either no paralysis or a paralysis on the opposite or on the same side, and in this variety also they greatly differ from the spinal cord.

Among the cases of paralysis on the side of the lesion, with disease of the base of the brain, there is one which must be singled out, asit shows more than any other that with the destruction of all (or very nearly all) the motor conductors of one side—those that some suppose not to have yet made their decussation, as well as those the crossing of which with similar ones of the other side is already made—paralysis can appear in the limbs and face only on one side, and that side the one in which the lesion exists. This case was long ago published by Mr. Stanley. The *left* side of the face of the patient was attacked with paralysis of motion and sensation; the *left* limbs were paralysed of motion. The autopsy showed that a tumour occupied the whole of the *left* side of the pons Varolii, extending into the *left* crus cerebelli.

If we now survey the whole field of the cases I have briefly mentioned or alluded to, it is clear that the following conclusion comes out forcibly from these facts—that there cannot be a doubt that there are cases in which hemiplegia has been caused by a lesion in the corresponding half of the brain. But is there no explanation of these cases in harmony with the universally admitted theory that one-half of the brain is the centre, or contains the centres, for the voluntary movements of the limbs on the opposite side?

Direct, like crossed paralysis, may be due to the most various organic causes: a wound, a tumour, an abscess, softening (due to embolism or inflammation) atrophy, or hemorrhage. Direct paralysis, like the other kind, may also be caused by disease almost anywhere in the brain: the meninges, the convolutions, the anterior, middle, or posterior lobes, the centrum ovale, the walls of the lateral ventricle, the crus cerebri, the crus cerebelli, the cerebellum, the pons Varolii, and the medulla oblongata, and also the corpus striatum and the optic thalamus. Direct paralysis can also, like crossed paralysis, be complete or incomplete, strike only one limb or both, be accompanied by contracture or convulsions, anæsthesia or hyperæsthesia.

Many persons erroneously believe that in our century cases of direct paralysis have been less frequently observed than in the preceding centuries; and this supposition is allied with the other, that at least many of such cases are worthless because the authors who have published them were not good observers. Besides the names of able or eminent men I have given already, there are many others, so that there is no doubt as regards the exactitude of *observation.* It will be enough to point out at random among the writers,

not yet named in this lecture, who have published cases of direct paralysis the following:—Dr. J. Hughlings Jackson, R. Bright, Mr. Campbell de Morgan, Cruveilhier, Prof. Horner, Dr. Peter Eade of Norwich, Jobert de Lamballe, Wenzel, Dr. Reynaud of Paris, Prof. Lebert, Gibert, Cazauvielh, Prof. Andral, Blandin.

Cases of direct paralysis are certainly not so very rare as is believed. I have seen five or six—two only, it is true, in which an autopsy has demonstrated the correctness of the diagnosis. Wedemeyer, Rostan, Mr. Callender, have each of them seen many cases. My friend Dr. J. Hughlings Jackson has seen at least two, and many other observers have also published two cases.

Reverting now to what I have said in the beginning of this lecture, I will repeat that it is not possible to look upon paralysis in cases of brain disease as being the effect of loss of function of the part diseased, and that we must admit that in those cases there is an irritation starting from the place we find diseased after death, and acting on more or less distant parts of the nervous centres, in such a way as to arrest their activity, and thereby cause the paralysis.

With this view, and only with it, we can explain that a lesion in one part of the cerebral lobes will produce or not a paralysis, that the paralysis will exist in the same or the opposite side, or in both sides (and there are many such cases in which a direct and a crossed hemiplegia simultaneously, or one after the other, will appear in consequence of a lesion in only one-half of the brain). With the view I have given, the immense differences that are found in the degree, the duration, as well as the seat of paralysis, can be explained, as we are to expect the greatest variety in effects of irritation, while this excessive variety is a death-blow to the admitted theory that paralysis in brain disease depends on loss of function of the part diseased.

These facts and reasonings, with many others mentioned in this lecture, as well as a great many not mentioned, lead to the following conclusions:—

1st. That it is wrong to conclude from the apparition of paralysis, when there is disease in the brain, that the loss of movements depends upon the loss of function of conductors or centres employed by the will in the production of movements.

2nd. That if there is any decussation of voluntary motor conductors anywhere in the base of the brain, it is not owing to the absence of such a decussation that direct paralysis sometimes appears.

3rd. That it is owing to an irritation that one-half of the brain is capable when diseased, of producing paralysis either in the corresponding half of the body or in the opposite one.—*Lancet*, *Jan.* 1, 15, *and* 29, 1876, *pp.* 2, 79, 160.

22.—TWO CASES OF NEURALGIA TREATED WITH CHLORIDE OF AMMONIUM.

By Dr. David Young, Florence.

The following two cases of neuralgia—one of the right ovary, and the other of the fifth pair—present several points of interest, and illustrate the value of the ammonium chloride in the treatment of these affections.

I. *Neuralgia of the right ovary of sixteen years' standing.*

Madame P., aged 37, widow, consulted me in January last. She gave the following history :—Married at nineteen; had three children, the youngest being sixteen—last confinement difficult and prolonged, but child born naturally. One month after she was seized with severe pain over the right ovary, which lasted three days. A fortnight later the menses appeared, and fourteen days after their cessation the pain returned in the old spot and continued about the same length of time.

For sixteen years matters went on in the same way. The monthly periods were regular and the discharge normal in quantity and duration. The pain came *on invariably* between the thirteenth and fourteenth day after the

menstrual period had ceased, and lasted from forty-eight to seventy-two hours. Sometimes the pain was not severe, but at other times so intense that it seemed, to use the words of Madame P., "like having a difficult confinement every month."

On examination the uterus was healthy and slightly anteverted; the right ovary was swollen and tender, and when examined per rectum was exceedingly painful. When I first saw the patient the pain had lasted about two days. I placed a pessary containing potass. bromid. gr. x. and ext. belladonna gr. ½ in the posterior *cul de sac*, and ordered fifteen grains of the chloride of ammonium every two hours till three doses were taken. Next morning the patient was free from pain and had slept well. Nothing further was done till after the next period. I now used a pessary containing potass. bromid. gr. x. and ext. belladonna gr. ½ every second night, placing it in the same position as before, and ordered fifteen grains of the chloride to be taken at eight, nine, and ten o'clock every night. The dreaded fourteenth day came, and with it only a very slight pain.

The above treatment was continued for two months longer, although the pain had not returned, and since then she his been perfectly well. After each monthly period during the course of the treatment there was slight tenderness, or rather uncomfortableness, in the region of the ovary, which was relieved by the pessaries, and therefore I continued to use them every other night while the patient was taking the chloride.

II. *Neuralgia of the ophthalmic and superior maxillary branches of the fifth pair.*

Madame Van C., a widow lady, aged 50, awoke about three in the morning with severe pain over the left eyebrow and shooting down the cheek to the nose. Thirty years previously she had neuralgia on the other side of the face, which was cured by large doses of quinine. The present attack had lasted two days before I saw her, and I found her suffering intensely, and exhausted from want of sleep. I ordered five grains of citrate of quinine every two hours till she had taken thirty grains, which caused great headache, but no cessation of the pain.

On each occasion the pain set in with great severity between three and four in the morning, continued till about ten o'clock, and then gradually diminished till it finally ceased, about midday.

On the evening of the fifth day from the commencement of the attack the chloride was given in ten-grain doses every hour, from six p.m. till midnight, with the following interesting and satisfactory results:—

6th day,	pain came on	3.30 a.m.	Ceased	one o'clock.
7th day,	"	4.0 a.m.	"	one o'clock.
8th day,	"	5.0 a.m.	"	at noon.
9th day,	"	6.0 a.m.	"	noon.
10th day,	"	7.0 a.m.	"	noon.
11th day,	"	8.0 a.m.	"	a little before noon.
12th day,	"	9.0 a.m.	"	noon.
13th day,	"	10.0 a.m.	"	noon.
14th day,	"	11.0 a.m.	"	noon.

On the 15th day, the attack began about 11.30 and continued for an hour with more severity than on any previous occasion, and subsided a little before one o'clock. The chloride was continued for three days longer, and till the time when my patient left Florence, six months after the beginning of the attack, she had had no further trouble.

Note I.—The chloride, if given in larger doses than fifteen grains, is apt to cause nausea, and in some cases diarrhœa.

Note II.—If administered at distant intervals—say of three or four hours—the effect is much less marked than when given rapidly and in anticipation of the onset.—*Practitioner*, *Dec.* 1875, *p.* 412.

23.—CASES OF SCIATICA AND NEURALGIA SUCCESSFULLY TREATED BY GALVANISM.

By S. J. KNOTT, Esq., Medical Superintendent of Galvanism, St. Mary's Hospital; late Tutor and Pathologist, &c.

If there is any inflammation of the nerve, then galvanism must be used cautiously. I believe in all cases where the nerve is implicated that faradisation would cause great pain, and do harm. The great thing to determine is how the galvanism acts in these cases, because it does good in cases where several counter-irritants have been used, such as blisters, liniments, &c. It depends on the cause of the sciatica or the neuralgia how the galvanism is used, and if the cause is decided on, then the amount of galvanism applied would be, up to a certain amount, as a tonic and stimulant to a nerve which is asthenic; the cells used would be few, and the application light. But if the complaint has been caused by cold, sitting on a wet seat, gout, &c., and the nerve is tender when pressed upon, and the pain very acute, then the cells must be very much increased, and the poles pressed well into the part. The operation should be only for a few minutes, but severe. Sometimes around the cutaneous parts on which the charcoal points have been placed there occurs a herpetic eruption. If galvanism is applied in this way it is the most powerful counter-irritant possible, and the relief to the sufferer is very great.

Sometimes one has to treat cases of neuralgia caused by great debility, at other times shock, and often in two applications the patients are well. Now no medicines do this, and if any apparent benefit is obtained the stomach or some other organ suffers, as the head does in large doses of quinine. Then there is the morphia treatment by hypodermic injection. Now this line of treatment is all very well for the time being, to relieve the great pain and distress, but does it cure the malady? No. About five months ago five cases came under my notice where for months and months men had been treated with morphia injections. One man had got up to four grains and three quarters daily. If this kind of treatment is persisted in where is it to stop? the patient may as well be an opium eater. At last this particular patient got a large abscess in the gluteal region, from the irritation of passing the needle, I presume, and thus got rid of his sciatica. In the case of asthenic neuralgia I believe the mild application of galvanism not only stimulates the weak nerve at the time, but is of a lasting character, for I have often heard a patient say that the whole limb kept warm for two or three days after. I also believe that by this more or less continuous stimulation fresh nerve-cells are caused to be formed, and so the weak nerve is permanently strengthened. And the reason that faradisation is injurious in this class of complaints is that it causes contraction of the enfeebled nerve, and if used strongly a breaking up of nerve-cells, and great pain at the time, and most likely followed by an aggravation of the symptoms. If others have been as successful as myself in the treatment of this class of complaints by galvanism, then I hope it will be tried generally, and it certainly will be a great boon to patients to have this done, instead of taking the powerful medicines some do, and after all only to ameliorate their complaint.

B. G., aged 54, a surgeon, came under treatment on June 15th, 1873. His history was that two months previous he had got wet and was obliged to sit in his damp clothes for nearly two hours. When he got home he shivered a little and felt cold all over. He went to bed, but was called up in the night and had to go to a midwifery case, at which he stayed some time. On the following day he felt much out of sorts, and in the evening had some pain and stiffness down the back of the left thigh, which, in spite of everything he could do, gradually got worse. He then consulted a well-known physician, and he was put through all the usual modes of treatment, but with little effect; in fact, in spite of very large doses of quinine and aconite liniment, he used to get worse towards night. At the end of the fifth week the pain used *to get very severe*, and last for about two hours every twelve hours.

He then came to me as a last resource. He walked into my room supported by two sticks. The pain he complained of reached along the left sciatic nerve, commencing just below the sciatic notch and extending to the popliteal space; he also began to feel pain in the loins.

I looked on this case as one of great congestion of the nerve, followed by effusion under the neurilemma; and the pain in the back as caused by the disease extending upwards towards the cord. I advised him to leave off all medicines so as to give the galvanism a fair trial, and to have recourse to the latter daily. I began with 18 cells of Stöhrer's battery. After the first application he stood up and said, "I believe this will do me good; the whole limb feels warm, which, in spite of wool, flannel, &c., it has not done for weeks." After the first week I galvanised him only three times a week, then twice; and in three weeks he said he thought he was quite well—at any rate, he would see if he could do without the galvanism; he did so, and has been perfectly well since. He took no medicine from the day he first came, and at the end of the first week left off all the wool and flannel, and only continued his ordinary merino drawers.

[Mr. Knott relates several other most interesting cases.]—*Lancet*, *Dec.* 18, 1875, *p.* 872.

24.—NITRATE OF AMYL IN NERVOUS CEPHALALGIA.

By Dr. R. A. Douglas-Lithgow, North Brink, Wisbeach.

Some six years ago I had my attention first directed to nitrite of amyl, and as this therapeutic agent is at present receiving great attention from the profession, I wish to make known one of its effects which I have found almost specific; and I do so more especially as I am not aware that the action of nitrite of amyl in nervous headache has been recorded recently. As will be seen, I lay no claim to the discovery myself. I think it was in 1869, whilst reading a number of the Edinburgh Medical Journal, I observed a remark made by the late Sir J. Y. Simpson, in the report of one of the meetings of the Edinburgh Obstetrical Society. He said he had found the inhalation of two drops of the nitrite give immediate relief in cases of nervous cephalalgia, however severe. From that time to this I have been in the habit of so using it, and, where due care was taken in the selection of cases, I have never known it fail to produce entire and almost immediate relief. In several instances I have had to increase or repeat the dose, but, as a general rule, two drops have been sufficient.

I place two drops on the palm of the patient's hand, and quickly diffusing these with my finger over the palmar surface, I tell her to cover her mouth and nose with her hand, and to inspire deeply and quietly. No time should be lost after the nitrite is dropped on the hand, as it evaporates rapidly. The patient should be seated while inhaling, as the peculiar effects of the nitrite are produced almost instantaneously, and may occasionally alarm a very nervous or hysterical female. Fortunately these symptoms last a very short time—generally less than two or three minutes,—and with their cessation the pain almost invariably ceases. Two drops may be given as a draught in water, instead of by inhalation, but I have found the latter mode much more satisfactory.

Dr. B. W. Richardson, to whom the profession owes almost everything concerning the true physiological action of this peculiar agent, says it is one of the most powerful relaxants of vascular tension we possess, and, bearing this in view, we can easily account for many of its physiological effects. I do not, however, propose to discuss these here, but I may just mention that, in addition to the "flushing of the face" which invariably results after the administration of nitrite of amyl, patients generally complain of great throbbing in the temples, "fluttering of the heart," and a feeling of breathlessness, as if they were "dying away." Some describe a sensation of "*tingling from head to foot*," and several have experienced pains in the limbs *analogous to* cramp, while in other cases every object seems to have acquired

a bright yellow hue, such as sometimes results from the use of santonine. These severer symptoms, however, are by no means common.

Used as I have just recommended, I don't think there is the slightest risk in its administration; but, owing to the temporary palpitation of the heart produced in most patients, care should be taken in administering it in cases of organic cardiac disease, &c. Should any excitement or other alarming symptom occur, cold affusion to the head, face, and chest, with a free supply of fresh air, are the proper means to use, but I have never had occasion to do so. The nitrite (which is cheap) should be procured from reliable makers only, and, as an economic suggestion, I recommend any one using it to preserve it in a stoppered glass bottle, having an additional glass cap-cover.—*Lancet*, *Oct.* 16, 1875, *p.* 556.

25.—THE TREATMENT OF SUNSTROKE BY THE SUBCUTANEOUS INJECTION OF QUININE.

By Surgeon A. R. HALL, Army Medical Department.

The experience of several medical officers in India is now apparently sufficient to prove that the hypodermic injection of quinine in heat apoplexy is the most successful method of treatment that has yet been adopted. I have had conversations with several who have used it; and a friend of mine, a Surgeon-Major, recently returned home, said to me:—"If there is anything in the practice of medicine which may be described as *magical*, it is the effect of the subcutaneous injection of quinine in sunstroke." Records of a good many recoveries have been published; but as a typical case, I select the following one recorded by Surgeon-Major T. C. O'Leary, M.B., Royal Horse Artillery, in the "Annual Medical Report of the Army for the year 1872." As I presume most of the readers of the *Practitioner* do not see this blue-book, I insert the case here in full:—

"A man of the D brigade, Royal Horse Artillery, was, with others, unavoidably exposed in shifting baggage at the break formed by the Kistna river, on the line between the Madras and Bombay Presidencies. He was young, healthy, and had not been drinking. The train was about to start, at three o'clock in the afternoon, from Raichare, when he staggered up to the carriage set apart for the sick, and asked for admission, saying 'he was dying.' The bell had rung, and no time was to be lost. The water chatties were filled, a lump of ice procured, and the two medical officers accompanying the Brigade entered the carriage with him. The cold douche was assiduously employed, ice was applied at the nape, and friction of the limbs kept up. Though the temperature of the surface was brought to its natural standard, the patient was making no rally, and the heart's action was rapidly failing. Stimulants could with much difficulty be administered, as the jaws were firmly closed, and complete insensibility was almost established; in short, the case was becoming desperate.

"Quinine had been recently recommended in cases of this nature, and, as a syringe was at hand, it was determined to introduce the drug subcutaneously. The effect was closely watched, and after the first injection the pulse at the wrist was felt to flicker; this encouraged a further trial, and the result was so satisfactory that a third injection was accomplished. Within a few minutes the circulation was fully established, the man sat up, stared vacantly about, and recognized those standing near.

"It is only necessary to add, that within half an hour from the time when the first injection took place the patient was partaking of mutton broth, and was partly feeding himself. He soon fell into so comfortable a sleep that the medical officers were at liberty to leave him, and on the arrival of the train, at seven o'clock in the evening, at Goolburga, he was practically convalescent. On reaching Kirkee next morning he jumped out of the hospital carriage, and would have marched to barracks had he been permitted.

"*The jolting of the carriage* did not permit a nice calculation to be made

of the quantity of quinine introduced at each injection, but the apothecary was of opinion that five grains in all must have been passed under the skin. No ulceration took place at the points of entrance of the needle."

During the month of May 1869 my friend, Mr. Walter Kerr Waller, of Calcutta, told me that he had been very successful in treating sunstroke by doses of 20 or 30 grains of quinine given by the stomach, and advised me to try it. A short time afterwards, I was called to see a driver of my battery, at Barrackpore, near Calcutta, who was a patient in hospital, and who was knocked down with heat apoplexy about five o'clock in the afternoon. I found him completely comatose, with dilated pupils, stertorous breathing, face very much flushed, skin of body red and *burning hot*, pulse full and rapid. I dissolved 20 grains of quinine in 20 minims of dilute sulphuric acid, and about 3 ozs. of water, and attempted to make him swallow it; but in vain. I therefore thought it a good opportunity for trying the hypodermic method.

A solution of 5 grains of quinine in 5 minims of dilute sulphuric acid, and 50 minims of water, was put under his skin, in different places, about the shoulders. Within one hour, the heat of surface had perceptibly decreased; he steadily improved during the night, was quite sensible next morning, and recovered without any bad symptoms. As far as I am aware, this was the first case in which quinine was *hypodermically* employed. Surgeon J. Anderson, at present with the "Chestnut troop" of Royal Horse Artillery, shortly afterwards, in the same hospital, treated a case with equally satisfactory results. I attended five cases of heat apoplexy at Barrackpore, and employed this method, and they all recovered.

Now, as to the condition of the patient, and the way in which the remedy acts. Heat, at first, acts as a stimulant on the vaso-motor centres, causing the heart to beat more forcibly and rapidly. But after a long time, the over-stimulated centres become exhausted; then the capillary vessels are dilated fully. This condition is now generally recognised as one of real debility. A writer in the *Lancet* of February 3, 1872, under the head of "Therapeutic Traditions," remarks:—"For the old idea, that sensible heat of skin with redness of the face in itself implies strength of constitution, no authority remains; the obvious fact being that surface redness means *vaso-motor paralysis*." One prominent symptom is noticed in heat apoplexy; that with increased amount of blood in the skin, there is entire suppression of *perspiration*. The sudoriparous glands have apparently lost their power of action. I have an idea that the pathological conditions of heat apoplexy, and the *secondary fever* of cholera are very like one another, each a state of exhaustion, the consequence of previous stimulation, and that in both these states stimulants and quinine do good.—*Practitioner*, *March* 1876, *p.* 196.

DISEASES OF THE ORGANS OF CIRCULATION.

26.—ON INTERMITTENCY AND IRREGULARITY OF THE PULSE, AND ON PALPITATION, CARDIAC AND AORTIC.

By Dr. GEORGE W. BALFOUR, Edinburgh.

Irregularity of the pulse is most frequently associated with mitral stenosis or with gout; no doubt it is also associated with other cardiac affections, or with apparently simple dyspepsia, rarely, however, I think, unless these affections or that dyspepsia be associated with the gouty dyscrasia. Simple intermittence, however, stands in a somewhat different category; sometimes it is only an early indication of failure of cardiac power dependent upon anæmia, over-work, or worry, or upon valvular disease or gout, but it is often a purely nervous phenomenon. In the former class of cases we have the affection commencing by an intermission, followed by a thump. As the dis-

ease progresses this thump becomes associated with a sensation of tumbling, and by-and-by the irregularity and inequality of the heart's action reveals itself to the sufferer by a rapid and irregular succession of thumps and tumbles of varying force. In the class of cases, however, to which I now refer, the disease never progresses beyond the thumping stage, and the thumps are not even very distinct; the patient has at the most an uncomfortable sensation in his cardiac region of varying intensity, lasting for less than a second, and if we happen to feel the pulse at that moment we become aware that this uncomfortable sensation is associated with the omission of a radial pulsation and nothing more; and sometimes this takes place regularly without the patient being in any respect conscious of it. Such cases are of purely nervous origin, and arise from sudden fright, grief, or anxiety; and the intermission thus produced, though for a time of frequent recurrence, gradually dies out, and sometimes disappears entirely, while in many cases it remains permanent, though much more infrequent than at first. This form of intermittence originates in the accidental coincidence of fright or anxiety with a heart congenitally or acquiredly feeble, or with a nervous system from similar causes unduly impressionable. I have known it commence with the shock of a railway accident, and in that case the intermissions were at first every second beat, but in a few months came down to one intermission in twenty beats, and I have no doubt will ultimately disappear. Richardson has known it follow shipwreck in one instance, with a somewhat similar result, and sudden grief, anxiety, or anger, in several other cases.

This form of intermission is simply an exaggeration of what we have all probably felt at one time or other when our heart has, for the moment, stood still in the face of any impending danger to ourselves or others. It is merely an aggravated form of what our vernacular poet James Smith has so graphically described as indicative of maternal anxiety:—

"My vera heart gaes loup, loup,
Fifty times a day."

This "loup" being nothing but the perceptible thump which succeeds a momentary intermission. In nervous, and therefore impressionable individuals, now and then, there is no returning thump, the intermission, as Paddy would say, becomes permanent, and we have sudden death from emotional causes, of which not a few are upon record. At other times, partly from the intensity of the impression but chiefly from debility of the nervous system, this "loup," thump, or intermission, of which the loup is the most striking subjective symptom, not only occurs under the instantaneous excitement of any emotion, but repeats itself, at first at shorter, afterwards at longer intervals, until at length it dies out under the reassertion of the normal condition of the nervous system. Now and then, however, it never dies out, but repeats itself so long as life continues. We may, however, be permitted to doubt in such cases if the emotional excitement have any other connexion with the intermittence except simply as the accidental incentive to a series of actions already from other causes about to begin. Be that as it may, however, the connexion between emotional excitement and muscular motility of a convulsive and rhythmical character is not an unknown thing in other departments of medicine; and cardiac intermittence and irregular action from emotional causes, finds its counterpart in those imitative choreas and epilepsies, which are of no infrequent occurrence, and has even no very distant connexion with the vagaries of the convulsionnaires and choreomaniacs of the Middle Ages.

In the treatment of intermittent or irregular pulse, we must be guided very much by the condition of the patient, and the existence of any actual cardiac disease, or of any irritation capable of reflexly producing such irregularities. And this we must carefully ascertain for ourselves, and never trust to the mere statements of the patient; because there is nothing more common than for a dyspeptic patient to say, "I never have a headache; I may eat and drink what I please, my stomach never troubles me." True, but his heart does; and careful examination will discover that his stomach is not so perfect as he represents it to be. It is precisely the same with him as with a patient *with neuralgia* of the shoulder-joint and a decayed molar-

tooth. "You need not look there," he says, "I never have toothache." But he winces when we touch the tooth, and if we get leave to extract it his neuralgia is cured. The one man has toothache in his shoulder, the other dyspepsia in his heart. The cases are analogous, and teach us to put more faith in our own careful examination than in the statements of any patient, which, let me add, however, there is no need to contradict. We are bound to cure our patient if we can, but it would be both thankless and dangerous to attempt to confute all his prejudices.

In the intermittent pulse of infancy and childhood little treatment is required; the bowels must be regulated if necessary, but more by food and exercise than by medicine, for whatever enfeebles the frame tends to keep up the intermittence. We must also by moderate exercise in the open air, early hours, plenty of sleep, and the use of a nutritious but unstimulating diet, seek to tone down any nervous instability, and to develop a state of rude unconscious health. The patient ought also to be warmly clad, and the use of quite cold water as a bath avoided, as any nervous shock ought to be most carefully shunned. If any remedies seem needful, the bromide of iron is a very useful one, or in very irritable patients it may be necessary to have recourse to the bromide of potassium, for a time at least.

In patients affected with cardiac disease, we of course regard the irregular pulse as a mere symptom, and treat the central lesion upon which it depends whatever that may be. In by far the larger proportion of cases it will be found to be mitral stenosis, as I have already told you; and as the irregular action accompanying this lesion is merely a sign of cardiac debility, what we require to do in these cases is simply to slow and steady the heart's action, increasing at the same time the force of its muscular contractions. All this we can do most effectually by the judicious use of digitalis, so much so, that in a few days the patient will express himself as feeling a new man, and he will not much mind any little remains of irregularity, which it may be difficult if not impossible altogether to remove. Of course, though digitalis in small, repeated, tonic doses, must be our main stand-by in these cases, other drugs as subsidiary agents are frequently of great importance and must be used *pro re nata;* such as carbonate of ammonia when bronchitic rhonchi are pesent; squill if there be much œdema—if only a little we may safely trust its removal to the digitalis; arsenic if there be much cardiac pain, which there seldom is in these cases; bromide of potassium, with or without morphia—subcutaneously or otherwise—if there be much nervous restlessness; and iron in some form or other if anæmia be a prevalent symptom.

When, however, intermittent or irregular cardiac action comes to be a subject for medical treatment apart from cardiac disease, the heart may still be soothed and steadied by small doses of digitalis if necessary, but the treatment falls mainly under three heads—*First*, to remove the cause if possible; *second*, to brace up the whole organism; and, *third*, to soothe the nervous system. If the cause be mental, such as grief or anxiety, all our care will frequently be baffled, and our success will usually depend not so much upon our remedies as upon our influence, and also upon the amount of mental firmness originally possessed by our patient, and whether he is still capable of being roused to exertion. In nervous shocks from anger or fright, we have a potent help in the narcotic needle, which timeously employed abbreviates the period of shock, and lessens its subsequent influence, besides giving the patient confidence in our resources and in their power to relieve him; the dose of morphia injected must, however, be a full one, and such as is sufficient to ensure sound sleep for some hours. We must in every case caution the patient against all depressing agencies, such as excess in venereal pleasures, excess in tobacco-smoking, too much work, especially intellectual work, all worry or excitement of any kind, and we must prescribe abundance of sleep, fresh country air, plenty of sunlight, perfect quiet, light amusing occupation, and nutritious diet in small quantities at regular intervals, suited to the requirements and capacities of our patient. But no solid food should be given at a less interval than four hours, so as to avoid introducing fresh *food into* a stomach still containing undigested material, as nothing is more *injurious;* but a tumblerful of hot water, or a large teacupful of hot solution

of Liebig's extract of beef, washes out the stomach, prevents the accumulation of flatulence, and often proves most useful in stimulating the completion of digestion and the emptying of the stomach.

Alcohol is the one domestic remedy which exercises the most potent influence upon an irregular and intermittent heart; it is, however, one which must be used with caution, because excess in its use is apt to perpetuate and increase the very evil it is employed to cure. Still, moderately employed, its action is not only palliative, but to a certain extent curative; only it must be employed in moderate doses, and in those forms which contain fewest substances likely to disagree, and these are in the main good sound claret, and pure whisky free from fusel oil or all injurious impurity. Next to these comes sound sherry, neither too dry nor the reverse, but of medium quality. Porter, ale, and beer are useful enough at times, as well as all other alcoholic fluids, but as a rule are not to be commended, though in every case we must be guided by the idiosyncrasy, the purse, and the convenience of our patient. The object we seek to attain is to provide a nutritive, diffusible stimulant, slightly narcotic or sedative in its qualities, and one the components of which shall disturb digestion as little as possible, while we also take care that the quantity introduced shall not be sufficient materially to interfere in this way. About two ounces of absolute alcohol is the most that can be introduced into the system in one day without detriment, but this may be given in divided doses, and in various forms, according to the requirements of the patient. Coffee, but especially tea, are excessively injurious to such neurotic patients; they ought therefore to be avoided, and a French breakfast, with meat, fruit, and claret, will be found to suit such a patient much better than our ordinary one with tea for its principal beverage; but if preferred, hot soup with a little well-boiled rice will answer equally well in most cases. For lunch a tumblerful of milk and Carrara water, a glass of beer, or a basin of soup, according to taste. For dinner, plain roast or chop, vegetables in moderation, no pudding, and two or three glasses of claret, or a couple of glasses of sherry, will be found very serviceable. No tea, and at night a glass of whisky and potass water, with or without a biscuit. This is a sort of model diet for such cases, which must be varied to suit each individual case. We must, especially in this climate, secure that whatever is taken in the morning be sufficiently stimulating to enable the patient to withstand the cold—especially in the winter—and to soothe him under the unavoidable worries of life. To this end, if soup be preferred for breakfast, a glass of sherry, or a tablespoonful of brandy stirred into the white of an egg previously dissolved in a little water with a pinch of sugar, will be found a most agreeable and useful lunch. What we must avoid is the production of a catarrhal condition of stomach, or its keeping up, if it already exist, as to that, more perhaps than to anything else, is due the persistence of intermittent cardiac action. But in these cases alcohol is really a remedial agent from which we can obtain more good than from any other drug, only it must be used as a drug, with caution. Definite rules only apply to definite cases, but there are three grand rules which appy to every case, and these are, that the alcohol must be given in a digestible as well as stimulating form, in divided doses throughout the day, and never in excess, otherwise we shall increase the evil we desire to cure.

What we desire to do in such cases is to brace up the general system, at the same time protecting it from injurious influences. Warm clothing, therefore, is a necessity, and cold sponging of the chest, especially every morning; but bathing, particularly sea-bathing, must be shunned as dangerous, the shock being only too apt to produce in such cases, spasm of the heart, cramp as it is so often called, which is so instantaneously fatal that the patient sinks, but is not drowned—he is dead before he sinks.

The drugs which will be found most useful vary with each case; pepsine in doses of 10 or 15 grains with each meal seems to do good always, but beyond that we must be guided by subsidiary symptoms. If there be much catarrhal irritation of the stomach, nitric or nitro-hydrochloric acid and calumba or quassia are often useful, soda, potass, or lime in the form of lime-water, often gives *great relief*, but never produces such a permanent effect

as the acids; occasionally the alkaline treatment may be combined with the acid one with advantage, the acids being given before food, the alkalies from half an hour to an hour subsequent to a meal, and with these we may combine the use of podophylline in quarter grain doses, with a third of a grain of ipecacuan and a quarter of a grain of belladonna, which in enfeebled patients unloads the liver, and relieves the right side of the heart without purging. If torpor of the liver be more marked, then small doses of blue pill and aloes just sufficient gently to move the bowels are most useful. If torpor of the colon be the chief apparent ailment, the long-continued use of Barbadoes aloes in small doses, with sulphate of iron, hyoscyamus, and nux vomica, answers very well; and if much flatulence be present, we may substitute a couple of grains of the compound galbanum pill for the hyoscyamus with advantage; or if gout be the fundamental ailment, then small doses of the acetic extract of colchicum with Barbadoes aloes, both in such doses as shall insure no more than one stool a little more bulky or looser than usual, and continued daily or every second day for some time, will be found most useful.

When a hæmatinic tonic is required, as will be the case in most instances, the citrate of quinine and iron will be found to be the mildest, and the one most useful in all cases, while Easton's syrups of the phosphates of strychnine, quinine, and iron, is the most powerful, and if continued in drachm doses twice a day for several months, will often effect a most wonderful improvement in the patient's health, and in the state of his heart; that it may do so we must be careful to have all catarrh of the stomach removed in the first place, and the liver also acting freely, otherwise this tonic will not only do no good, but occasionally seems to do harm.

Whenever, from the state of the patient, and the defective secretion of urea, gout seems to be impending, the most important remedy will be found to be the free administration of colchicum along with alkalies.

Although for temporary purposes there is no sedative equal to the subcutaneous injection of Squire's solution of the bimeconate of morphia, yet for continuous use as a nervine sedative bromide of potassium far surpasses it, but it must be given in full doses, from half a drachm to a drachm three times a day, till its full sedative effect is secured.

You will see then, that for the relief of intermittent and irregular cardiac action, we must endeavour first to determine the lesion upon which it depends, cardiac or otherwise, and we must treat this with due regard to the organic debility to which that lesion owes its injurious efficiency, and we must meanwhile not forget that between the cause and its effect we have the nervous system as a connecting link, and that by modifying or interrupting this connection, which we often can do by the judicious use of sedatives and narcotics of various kinds, we may cause to cease, or at all events mitigate the results pending our attempts at cure.

Cardiac palpitation is only too frequently dependent upon similar causes as irregular action, and is to be treated accordingly, especially by such means as shall restore a normal tone to the heart and to the organism generally. Now and then, however, an apparently accidental though violent attack of palpitation seems dependent upon acidity of the stomach, and can often be at once relieved by an anticid draught of soda, potass, or ammonia; and indeed not only palpitation, but also some of the minor forms of irregular action are promptly relieved by a draught containing a drachm of aromatic spirits of ammonia, with or without an equal quantity of tincture of valerian, or failing that, by a tablespoonful of whisky or brandy, with a teaspoonful of carbonate of soda, in about a wineglassful of water, just enough not wholly to drown the miller, as we say in Scotland.

Epigastric pulsation depending on irritability of the abdominal aorta is a local neurosis not always apparently dependent on dyspepsia, nor to be relieved by tonics. I have, however, found it almost invariably to yield to full doses of the bromide of potassium in some bitter infusion such as calumba, gentian, or chiretta. The only exception to this that I remember seeing was that of a woman, in whom this excessive abdominal pulsation was accompanied by a preternatural hardness of that part of the artery, probably due to

atheromatous disease, and in her case large doses of the iodide of potassium gave great relief, though nothing had any permanently curative effect.

In connexion with the subject of increased cardiac action generally, I may mention, that while increased action is liable to follow any unusual exertion, such as climbing a stair or going up a hill, both in hearts valvularly diseased and also in those which are simply weak, palpitation or irregalar action occurring while the patient is at rest is by no means to be regarded as a certain symptom that a heart is only weak or gouty, because of course hearts valvularly diseased are always weak, and often gouty, and therefore liable to present the symptoms of both diseased and also of simply feeble hearts. There is, however, one peculiarity by which the valvularly diseased heart may be perfectly discriminated from a simply weak heart, and that is, that while palpitation or cardiac discomfort occurring as the result of exertion in a heart valvularly diseased can never be relieved by anything but rest, the same results following exertion in the feeble heart of a nervous or gouty individual are frequently calmed down by any emotional excitement, especially of a pleasurable kind, such as meeting a friend, or the sight of anything novel or attractive, or even, strange to say, by a more violent exertion. Thus a man with a heart merely valvularly diseased is not likely to have any discomfort unless he meets with a slight ascent in his walk, when he is at once brought up, and must rest; but a man with a gouty or feeble heart, though he too may be "afraid of that which is high," and may also suffer during the ascent, yet has his palpitation at once relieved by any emotional excitement, and if he be seized with sudden palpitation while walking slowly on the level, he will often find it disappear at once if he takes a short race to the next lamp-post: the heart beats the faster for the exertion, but the palpitation is gone, affording an example of a very peculiar form of inhibition, which probably only those can truly appreciate who have experienced it.—*Edinburgh Medical Journal, Jan.* 1876, *p.* 616.

27.—EXTREME SLOWNESS, FOLLOWED BY GREAT IRREGULARITY OF THE PULSE, WITH NO ORGANIC DISEASE OF HEART, TREATED BY BROMIDE OF POTASSIUM AND BELLADONNA.

By Dr. R. Somerville and Dr. Brunton.

Attention having been called some little time ago in the British Medical Journal to cases of extreme rapidity of pulse, I am reminded of a case of extreme slowness, which ought to have been published before this time.

A professional man, aged 37, temperate in his habits, not a smoker, who had enjoyed good, but not robust, health, had for some months been subjected to a great deal of worry in business. For a few days before I saw him he had been out of sorts from irritation of the stomach, but on the night previous to his pulse becoming so slow, he had gone to bed feeling much better, and in hopes of being able to resume his ordinary duties in the morning. He had most imprudently, however, eaten salt fish to supper. He spent a restless night in consequence, and towards morning vomited several times. I saw him at 9 a.m. By that time he was up and dressed. He made great complaint of a feeling of oppression at the epigastrium. His tongue was clean. His pulse was normal in all respects but in that of rate. Its beats numbered only *twenty-five* in the minute. He was sent back to bed and was ordered a glass of brandy, and to have a mustard poultice applied over the stomach.

11 a.m. Patient no worse, but there is no improvement. To go on with the brandy, taking also beef tea, and some light farinaceous food.

10 p.m. In all respects the same. There has been no vomiting during the day. The rate of the pulse continues the same: it does not count more than twenty-five. The action of the heart, except as regards rate, is normal.

Second day.—Pulse has, during the night, quite changed in character:

it is much quicker, and very irregular. The action of the heart is tumultuous. No murmurs to be heard. Patient still complains of great oppression at the præcordium, but there is no vomiting. He is very desponding as to his prospect of recovery. Was seen to-day by Dr. Begbie of Edinburgh, who was of opinion that the disorder of the heart was functional only, and who advised large doses of bromide of potassium with tincture of belladonna.

Third day.—Pulse and heart as yesterday, but præcordial oppression scarcely so great,and patient rather more hopeful.

Fourth day.—Still great irregularity of the pulse, and heart very nearly as tumultuous in action. No vomiting. Bowels acting normally.

Eighth day.—The heart and pulse have, since last entry, continued to improve, and to-day they have attained to perfect regularity of action. Patient is gaining strength, being now able to take substantial nourishment.

It is now more than three years since the above notes were taken, and the gentleman whose case they detail has since then enjoyed good health, and has remained perfectly free from all cardiac symptoms.

[The editor of the Practitioner, Dr BRUNTON, makes the following very interesting comments on this curious case.]

There can be little or no doubt tht the peculiar symptoms observed in this case were due to irritation of the pneumogastric nerve. It was long ago discovered by Edward Weber that this nerve, when irritated, either stopped the heart altogether or greatly lessened the frequency of its pulsations in animals, and in 1865, Czermak showed that it possessed the same power in man. This physiologist was able to irritate his own vagus nerve on the right side by pressing with the finger at the inner side of the sterno-mastoid muscle, and thus squeezing the nerve against a small, hard lump, which I have heard, from good authority, was really an exostosis from one of the cervial vertebræ, although it is often said to have been an enlarged and hardened gland. Whenever he did this, his pulse fell to less than half its normal rate, and he experienced a peculiar sensation of oppression or constriction in the sternal region. As these were exactly the symptoms presented by the case just narrated, I think we may fairly conclude that both the slow pulse and the epigastric oppression observed in it were caused by irritation of the vagus, and may proceed to consider what part of the nerve was affected. The nerve may be divided into three parts, viz.: its roots in the medulla oblongata, its trunk, and its terminal branches in the heart. The effect upon the pulse will be much the same whatever part of the nerve is irritated. The medulla is the part in which alterations in the activity of the nerve, leading to changes in the pulse rate usually take place. The trunk is only affected in rare instances, such as that of Czermak; but the terminal branches in the heart are more frequently acted upon by poisons such as nicotine, conveyed to them by the blood. These poisons may at the same time exercise a similar action on the medulla. In the present instance there was nothing whatever to indicate that the trunk of the vagus was affected, and the point of irritation might be either the roots in the medulla or the ends in the heart. Now, the supper of salt fish was evidently the cause of the disturbance, but it is not very easy to say whether it produced its effects by acting as a poison or simply by irritating the stomach. There are a good many instances on record of a subtle animal poison becoming developed in salt fish or sausages; a poison which not only eludes the efforts of the chemist to detect it, but which seems to have a curiously limited action, frequently doing no harm to the lower animals, though proving fatal to man. Although the symptoms observed in this instance differed considerably from those usually produced by the poison generated in salt fish, it is nevertheless possible that this was a case of the sort, and that the peculiarities it presented were due to the poison being in very small quantity, but acting on a subject rendered exceedingly susceptible by previous overwork. If present at all, the poison must have been in such small quantity as not to affect persons in ordinary health, for the others who partook of *the salt fish* at the same time experienced no inconvenience from it. But it is *also possible* that the fish produced slowness of the heart simply by irritating

the stomach, and thus causing reflex irritation of the vagus and slowing of the cardiac pulsations, as Meyer and Pribram found pinching the stomach to do. If such were the case, the irritation would be conducted by the afferent nerves from the stomach to the medulla, and thence downwards by the vagus to the heart.

It is, as I have already said, exceedingly difficult to decide whether the salt fish acted in one or other, or both, of the ways just mentioned. In most cases of poisoning by salt fish, the pulse is either normal or quicker than usual, and this militates against the supposition that the slowness in the present instance was due to a special poison generated in the fish; and, on the other hand, although the slowness continued a considerable time after vomiting had ceased, there was probably still some gastric disturbance present, as it was not until the eighth day, when the pulse had become almost quite regular, that the patient was able to take substantial nourishment. It seems therefore, not improbble that the affection of the heart was due to reflected irritation from the stomach, and, although the symptoms were so different, might be classed along with those cases in which we find increased pulsation and palpitation depending on gastric disorder.

It is, however, also possible that a special poison might have something to do with it, and the treatment adopted was such as to meet both possibilities.

Supposing it to be of a reflex nature, the bromide of potassium would be useful, as it seems to have the property of diminishing the activity of reflex centres generally, and by acting in this way upon the medulla, it would prevent the irritation it had received from the stomach from being transmitted down the vagus to the heart.

If, however, there was a special poison in the blood, irritating either the roots of the vagus in the medulla or its ends in the heart, the bromide would be of little use, but belladonna would be successful. For belladonna and its alkaloid, atropia, in large doses, paralyse those nervous structures of the heart in which the vagus ends, so that no irritation of any part of the nerve whatever can slow the pulsations. As doses of belladonna, large enough to paralyse the vagus, usually produce dryness of the mouth, delirium, and other unpleasant symptoms, the drug was not pushed to its full extent in the present instance, trust being rather placed in the bromide; although, had the interference with the heart's action been such as to threaten danger to life, recourse might have been had with advantage to large doses of belladonna.—*Practitioner*, *March* 1876, *p.* 186.

DISEASES OF THE ORGANS OF RESPIRATION.

28.—ON THE COMBINED USE OF MORPHIA AND ATROPIA IN THE TREATMENT OF SPASMODIC ASTHMA.

By Dr. G. Oliver.

[The writer corroborates the opinion of Dr. Keith Anderson as to the value of morphia given hypodermically in the treatment of spasmodic asthma, during the paroxysm.]

While regarding morphia as the principal agent in relieving asthmatic spasm, I have found the combination of it with atropia to act more quickly, and to combat the attacks more completely and effectually. Atropia seems to assist morphia not only in quelling the nervo-muscular storm, but in obviating the distressing and depressing after-symptoms of morphia narcosis which now and then are met with. Besides this, belladonna is now fairly established in the therapeutics of asthma, chiefly through the advocacy of Trousseau, Scé, Hyde, Salter, and G. Wood.

We may look upon the subcutaneous use of the active principle—atropia—as of value at least equal to that of the ordinary administration of belladonna.

There is still another reason why atropia may enable the asthmatic to derive more benefit and a safer relief from the combination of it with morphia than from morphia alone. Dr. See has shown (Practitioner, 1869) that belladonna quickens respiration, and, during the paroxysm, the altered respiratory rhythm of asthmatic breathing is changed to one of a different type; but, during the second stage, "the breathing becomes slower from fatigue of the pneumogastrics, and we have now a renewed indication for the use of belladonna, which will quicken respiration again. It is for this reason that you must not prescribe opiates, as is often done by physicians who are called in during the attack, and will insist on soothing the patient at any cost. Opium acts inversely to belladonna; it diminishes the frequency of breathing to the damage of the patient." While the pneumogastrics are exhausted, may not the injurious depression of morphia be checked by the stimulating power of atropia? Here the guarded use of opiates is a cardinal point of treatment; but to secure from them a relief from suffering without dangerous depression is a real gain.

But an appeal to experience is all-important:—

In July, 1871, a lady, aged 30, came under my care suffering intensely from spasmodic asthma of a somewhat bronchitic type, yet the neurotic element was very prominent. She had suffered for four years from very violent paroxysms, usually ushered in by slight bronchitis: each attack confining her to bed for a week or two, and the quiet intervals were too short to allow her to regain her strength properly. The lungs and heart were free from disease. Most of the ordinary remedies had been tried with only partial relief. The late Dr. Salter prescribed for her large doses of belladonna with ipecacuanha, which, affording somewhat more benefit than other drugs, were freely consumed in desperation by the patient who was hungering for relief at any cost. With dilated pupils, dry throat and foul tongue, the agonising spasm would only partially relax, and an unusually severe midnight paroxysm, which I was summoned to treat, would not give way at all. I injected a third of a grain of acetate of morphia;—in about ten minutes the breathing was calm and nearly free from wheezing. On awaking next morning nausea, vomiting, and headache detracted somewhat from the joy of my patient at having discovered a remedy so effectual and so speedy in its operation. After repeating the injection with the same results I combined with the morphia $\frac{1}{100}$ gr. of sulphate of atropia. Within a shorter period—not exceeding five minutes—the breathing was comfortable and free from wheezing, and next morning nausea, vomiting, &c., were not complained of. On one or two occasions I used atropia alone; the result being relief to the breathing in about ten minutes. It was quite clear the relief was much less decided than after morphia alone, and this was inferior to the combination of both remedies, which set the patient's breathing perfectly at ease for the night without the penalty of vomiting and headache in the morning. The subsequent history of this case has shown these points of experience:—

1. Morphia and atropia are superior to morphia alone; the good effect is more speedy and complete, and they produce no depressing gastric disturbance.

2. During the first year of subcutaneous treatment the asthmatic paroxysms were, as a rule, met by the injections as soon as relief was urgently demanded. The patient struggled on with her attacks before calling in her medical attendant who, only then, injected the remedies. While these attacks in mid-career were always quickly brought under control, they—as severe asthmatic paroxysms—notwithstanding the continued use of the injections, required time for complete and safe subsidence. While thankful for a means so effectual as this in quelling the violent storms, my patient sought for further benefit by attacking the earliest approach of them by the injections. This *combined prophylactic* and curative use of the remedies has been resorted to *during the last* three years, and, during this long period, there has not been

one severe attack as in former years. At the very onset of bronchial disturbance, an injection night and morning for a few days together has usually kept the threatened asthmatic spasm in abeyance and apparently stamped out the beginnings of an attack of the old type. Besides this, the patient asserts there is less susceptibility to bronchial attacks as well as the accompanying asthma, and the intervals between the attacks are lengthened, asthmatic breathing being often totally absent for a month or six weeks.

3. The very frequent use of the injections does not appear to injure the general health.

4. Speedy relief. The effect is generally declared in five minutes in the form of comfortable sleep and quiet breathing. The most intense attack has given way completely in from fifteen to twenty minutes.

This case shows that we may arrest in the earliest stage an attack of spasmodic asthma, thus preventing much suffering, removing the evil effects of the attack, and prolonging the intervals of ease. The nerve-bias, fostered by every attack, which ingrain more and more the "asthmatic habit," may be persistently and successfully resisted by the repeated subcutaneous employment of morphia and atropia.—*Practitioner, Feb.* 1876, *p.* 137.

29.—HOW TO CURE A COLD IN THE HEAD.

By Dr. David Ferrier, Assistant Physician to King's College Hospital.

[We all know the miseries of a cold in the head, and the inconvenience rising from it. Dr. Ferrier having succeeded in arresting one with which he was threatened, by the treatment recommended, brings it under the notice of the profession.]

The symptoms being those of acute catarrh of the nasal mucous membrane, the treatment which seemed to me most likely to succeed was that which I have always found most efficacious in acute catarrh of the gastric mucous membranes. In the acute catarrh of alcoholism accompanied with profuse secretion of mucus, which is often vomited up in large quantities almost without effort, as well as in the more chronic forms of gastric catarrh, bismuth alone, or in combinaton with morphia, acts almost like a specific.

On the same principle the topical application of bismuth to the nasal mucous membrane seemed to me the plan most likely to be followed by beneficial results. I do not know whether the plan is absolutely original, but I am not aware of its having been adopted previously. This, however, is of no importance compared with the question of its efficacy. On the evening in question I began to suffer with the symptoms of cold in the head—irritation of the nostrils, sneezing, watering of the eyes, and commencing flow of the mucous secretion. Having some trisnitrate of bismuth at hand, I took repeated pinches of it in the form of snuff, inhaling it strongly, so as to carry it well into the interior of the nostrils. In a short time the tickling in the nostrils and sneezing ceased, next morning all traces of coryza had completely disappeared.

Bismuth alone, therefore, proved quite successful, but it is better in combination with the ingredients in the following formula. Bismuth by itself is rather heavy, and not easily inhaled, and it is, moreover, necessary that it should form a coating on the mucous membrane. It is, therefore, advisable to combine it with pulv. acaciæ, which renders the bulk larger and the powder more easily inhaled, while the secretion of the nostrils causes the formation of an adherent mucilaginous coating, of itself a great sedative of an irritated surface. The sedative effect is greatly strengthened by the addition of a small quantity of hydrochlorate of morphia, which speedily allays the feeling of irritation, and aids in putting a stop to the reflex secretion of tears.

The formula which I find on the whole the most suitable combination of the ingredients of the snuff is as follows:—Hydrochlorate of morphia, two

grains; acacia powder, two drachms; trisnitrate of bismuth, six drachms. As this is neither an errhine not a sternutatory, but rather the opposite, it may be termed an anti-errhine or anti-sternutatory powder. Of this powder one-quarter to one-half may be taken as snuff in the course of the twenty-four hours. The inhalations ought to be commenced as soon as the symptoms of coryza begin to show themselves, and should be used frequently at first, so as to keep the interior of the nostrils constantly well coated. Each time the nostrils are cleared another pinch should be taken. It may be taken in the ordinary manner from between the thumb and fore-finger, but a much more efficacious and less wasteful method is to use a small gutter of paper, or a "snuff-spoon," placing it just within the nostril and sniffing up forcibly so as to carry it well within. Some of the snuff usually finds its way into the pharynx, and acts as a good topical application there, should there be also pharyngeal catarrh. The powder causes scarcely any perceptible sensation. A slight smarting may occur if the mucous membrane is much irritated and inflamed, but it rapidly disappears. After a few sniffs of the powder, a perceptible amelioration of the symptoms ensues, and in the course of a few hours, the powder being inhaled from time to time, all the symptoms may have entirely disappeared.

I am writing this note cured of a cold in the head which I began to manifest in a very decided manner last night—viz., weight in the frontal sinuses, tickling of the nostrils, sneezing, watering of the eyes, and commencing flow of the nasal mucous.

I commenced taking the snuff, continuing at intervals for about two hours, thoroughly coating the interior of the nostrils with it. Next morning I found myself entirely free from catarrh. The effects in my own case have been twice so rapid and beneficial that I look with comparative indifference on future colds. In the case of others to whom I have recommended the same treatment equally rapid and beneficial results have followed. One of my students in King's College Hospital described the effects as quite magical and unexpected, having in this way got rid of a cold in one evening. The other day one of the officials in King's College asked me if I could do anything to check a dreadful cold in the head which he had just caught. I gave him the above prescription, asking him to note the results. A day or two after he came and told me that I had given him very marvellous snuff, as he had not taken more than one-eighth part before he had got rid of all his uneasiness and discomfort. Though I have not yet had very many opportunities of trying this method of cure, the success so far has been such as to warrant my recommending it as a rapid and efficacious treatment of nasal catarrh.—*Lancet*, *April* 8, 1876, *p.* 525.

[We should prefer to use this remedy without the morphia.—EDS.]

DISEASES OF THE URINARY ORGANS.

30.—PATHOLOGY AND TREATMENT OF ALBUMINURIA.

By Dr. T. LAUDER BRUNTON, F.R.S., &c., Editor of the *Practitioner*.

[Dr Brunton has given us a very interesting paper on this subject. How many cases we have of anæmia—the patients being blanched, and overcome by the least exertion.]

The blood has to act as a carrier of oxygen from the lungs to the tissues. All muscular work, all secretion from glands, in fact we may say, every process of life is a process of combustion. Whenever the supply of oxygen fails the work is lessened, and at length stopped entirely, just as the exclusion of *air would extinguish* the fire in a furnace, and bring to a complete standstill *the engine* to which it furnishes the motor power.

Now the combustion in the body goes on at a great distance from the outer air, and it would stop for want of a sufficient supply of oxygen were it not for the hæmoglobin of the blood. The hæmoglobin is the red coloring matter of the blood, and is contained in the red corpuscles alone. When they are deficient it is deficient, and its chief function and theirs is to act as a carrier of oxygen. It takes up this gas in the lungs, carries it to the tissues, and then gives it up to them. At each breath that a man takes he saturates a quantity of the hæmoglobin in the bloodvessels of his lungs with oxygen, and then on it goes to his muscles to keep up combustion in them. If he is running, leaping, rowing, or using his muscles much in any way whatever, they must get more oxygen than when he is sitting of lying, and in order to give them as much as they need he must breathe much oftener than usual. ,By doing this, a healthy man can get enough oxygen to enable him to make great exertions, and if his work is only moderately hard he scarcely feels that his breathing is different from usual. But if he unfortunately happens to have a quantity of fluid in his chest, so that one lung can only expand to half the size it ought to do, he cannot take in the proper quantity of oxygen at each respiration. He is therefore obliged to breathe oftener so as to make up for the small quantity of air that he can take in each time, and so a moderate exertion will make him puff and blow like a healthy man after a hard run.

Now, exactly the same thing takes place when a person has too little hæmoglobin and red blood corpuscles as when he has too little available lung tissue. It is easy to see this. If a man has only half the quantity of hæmoglobin in his blood that he ought to have, it can only take up about half the amount of oxygen that it ought to do, and there is not much to choose between this condition and the case where only one lung is working, and thus giving only half the proper quantity of oxygen to the blood. If the blood only *takes* half the right quantity of oxygen, it is much the same as if it only *gets* half the right quantity.

Thus it is that anæmic persons are short of breath, and if they go quickly up stairs, they puff and blow so that they cannot speak when they get to the top, and, in short, they are incapable of any great exertion.

Thus the first symptom of anæmia, not to mention the pallor, is muscular weakness; the second is shortness of breath.

The third symptom, or set of symptoms, refers to secretion. As I have already said, secretion is a process of oxidation as much and perhaps even more than muscular contraction is. Ludwig and Spiess found that the saliva secreted by the sub-maxillary gland of a dog was actually 1½° C. warmer than the blood of the carotid artery, and of course to heat the saliva in this way there must be very active combustion going on in the gland during the process of secretion. To supply the oxygen required for this combustion, the arteries of the glands are found to dilate, and torrents of brght-red oxygenated blood rush rapidly through them. Nor is this process confined to the salivary glands alone. The stomach, the pancreas, and probably also the intestines, all get a copious supply of arterial blood during the process of secretion, and although a rise of temperature indicative of active combustion has not been demonstrated to take place in them during the act of secretion, it is in the highest degree probable that these other glands resemble the salivary ones in this respect. Seeing, then, that oxidation plays such an important part in secretion, we could hardly expect that it would go on briskly, any more than the muscles would work easily when the blood is poor in hæmoglobin, and the supply of oxygen which it ought to convey to the glands is consequently deficient.

Now the whole process of digestion depends on secretion, and if the salivary glands and pancreas do not secrete properly, the starchy part of the food will not be rendered soluble; if the stomach does not pour out gastric juice, the albumen and fibrine will not be digested; and if the pancreas is not working the fats will pass out unchanged. And even when these organs do their work after a fashion and succeed in digesting the food at length, yet if they secrete their appropriate juices in small quantity the food will be only slowly digested. *It will then undergo* partial decomposition in the intestine instead

of being rapidly dissolved and will give rise to the formation of gas in the intestines with all its attendant discomforts. The symptoms of this condition are—there is no appetite, the food lies heavy at the stomach, and there is frequent belching of gas which often brings up with it particles of undigested food or sour burning liquids. There is often nausea, sometimes retching, or vomiting. The bowels are sometimes very loose and at others very confined.

We may thus add to muscular weakness and shortness of breath a third symptom of anæmia, viz., *dyspepsia.*

Having thus found that the muscular, respiratory, and digestive functions are all impaired by anæmia, we naturally inquire how the nervous system gets along. The brain cannot work without oxygen any more than the muscles, indeed it requires a still more constant supply than they, and when we direct our attention to it we find that it enjoys no exemption from the general debility. Deficiency of motor power manifests itself in languor, listlessness, and laziness, while the sensory functions evidence their disturbance by giddiness, drowsiness, headache, weight in the head, throbbing of the arteries, neuralgic affections, and numberless odd nervous symptoms, which lead medical men who are themselves suffering from anæmia to believe that they have all sorts of mischief going on within their brain-pan, until a little quassia and iron removes their symptoms and allays their apprehensions.

We come lastly to the circulation, and we find that it too suffers, so that although we have put it last, one of the symptoms connected with it sometimes attracts our attention more than all the others together. This symptom is œdema or swelling from the presence of fluid in the cellular tissues.

How does this fluid come to be there? During life there is a constant exudation of fluid from the bloodvessels, and after this has done its work, by affording nutriment to the cells of which these tissues are composed, it is again absorbed, partly by the veins and partly by the lymphatics. In health the exudation and absorption balance each other and so there is no accumulation of fluid in the tissues; but whenever the exudation becomes too rapid, or the absorption becomes too slow, such an accumulation takes place. When it occurs in the tissues it is called œdema; when in a large lymphatic space, better known perhaps by its more common name of serous cavity, it is termed dropsy.

Now absorption has been shown by Goltz to depend very much on the vaso-motor nerves. When these are acting powerfully, absorption takes place rapidly; when they are acting slightly, absorption takes place slowly.

Deficient action of these nerves also causes fluid to be poured out more rapidly from the vessels, as well as to be absorbed more slowly. Thus any weakness of the vaso-motor system tends to produce œdema in a double fashion, and to such weakness we may probably ascribe the œdema we meet with in anæmia. It is quite evident that if the œdema is dependent on deficient re-absorption, we shall find it most marked in those parts where the circulation in the veins and lymphatics is most languid—*i.e.*, in the feet and ankles; and this is indeed what we do find in œdema depending on venous obstruction; but when it depends on excessive exudation also, it may be found wherever the tissues are loose, as in the lower eyelid and scrotum. In health the vaso-motor nerves keep the arterioles throughout the body more or less contracted, and thus prevent the blood which the heart pumps into the aorta from running out quickly into the veins. They thus keep the arteries always well filled and fairly on the stretch, so that the heart cannot empty itself into them, and thus stretch them still more without using a fair amount of force. But when the vaso-motor system gets weak, it no longer keeps the arterioles up to their work, and in consequence they occasionally dilate and let the blood through them more quickly than they ought. The arteries consequently get partially emptied; the heart can pump all the blood into them, with almost no exertion, and so it sometimes seems as if it did not know what to do with its superabundant energy, and works fast and loose like the driving-wheel of a locomotive on a piece of greasy rail. Another *symptom of* anæmia is, therefore, palpitation.

We may now at last count up on our fingers the symptoms of anæmia, not

reckoning, but always bearing in mind, the pallor of the patient. We have (1) muscular weakness; (2) shortness of breath; (3) dyspepsia; (4) weakened nervous system, both sensory and motor; (5) weak circulation leading to palpitation, and œdema or dropsy.

All the varied symptoms included under these five heads may, as we have seen, be caused by anæmia, though we must not forget that some of them may be present without anæmia. For example, an individual may come complaining of dyspepsia, though a single glance at his plethoric countenance shows you that no want of blood is the cause, but rather gourmandizing and gluttony above the powers of even the most healthy stomach to sustain. But supposing we have all the symptoms included under the five heads just given, and the pale face and blanched mucous membranes leave no doubt on our minds as to the presence of anæmia, we have next to ask what is the cause of it, in order that, instead of trying to remedy one symptom by itself and another symptom by itself, we may strike at the root of the disease and remove the anæmia on which they all depend.

There are two ways in which a man may come to want money; (1) he may not get enough to supply his daily wants, either from laziness or misfortune; or (2) he may lose what he has either by being extravagant and squandering until poverty compels him to tighten his purse-strings—steadily living above his income, and thus losing his fortune by degrees; or by rashly speculating, and thus losing a great part of it at one stroke.

And just so it is with the blood. We use up some of it every day to keep our tissues in working order; and unless this loss were regularly compensated by the food we eat our blood would soon be too much reduced in quality, if not in quantity, to sustain life. For be it remembered that a proper quantity of blood will not nourish the tissues if its quality be deficient, any more than an ounce of copper will pay a man's debts when they amount to an ounce of gold. Whenever, then, this nourishment which is daily received into the blood, is insufficient to supply the daily expenditure on the tissues, anæmia will, in a greater or less degree, be sure to follow. It does not very much matter whether the supply of food taken into the mouth is insufficient, or whether imperfect digestion prevents assimilation. Dyspepsia, then, by lessening the appetite, and rendering the digestion of such food as is consumed less perfect than it ought to be, has much the same effect as partial starvation and is one cause of anæmia.

But anæmia we have already seen is a cause of dyspepsia; and thus the one aiding the other they go on from bad to worse, in a vicious circle unless something interferes to break it.

The cases of anæmia which I would liken to the spendthrift are those of chlorotic girls where the anæmia really seems to depend on some of the organs or tissues using up the blood in a way they have no right to do, and thus squandering the precious fluid without getting any good from it, and indeed without one's being able to see where it has gone, unless the deep red colour of the urine one gets in such cases on the addition of nitric acid to it may be taken as an indication that more than a fair share of the hæmoglobin of the blood has undergone some mysterious transformation, and found too ready a way of escape through the kidneys.

Anæmia may also be a consequence of sudden and considerable losses of blood, such as those which occur in menorrhagia, or from bleeding piles, which not unfrequently drain away the vital fluid and sap the patient's strength, ere ever he be aware of the mischief which is going on.

Important as these causes of anæmia are, there is yet another no less important, and in which the drain is still more constant, although in it one may not see the blood actually leave the body while still retaining its well-known colour.

This cause to which I wish especially to direct your attention is albuminuria.

In it the blood is constantly losing one of its most important constituents, the albumen, which leaks through the kidneys along with the urine, and thus runs to waste instead of remaining in the body and ministering to its nutriment. *Although* the serum-albumen thus lost is not a constituent of

the red blood corpuscles, yet the deficiency in it seems in some way to affect them, and their numbers diminish possibly, though we cannot say with certainty, because they cannot get the albuminous constituents of their hæmoglobin in requisite quantity. For it must be remembered that the hæmoglobin, or colouring matter of the blood which plays such an important part in the oxygenation of the tissues, consists of an albuminous substance, globulin, and a non-albuminous substance, hæmatin. There are regulating arrangements in the body which keep all its different parts in mutual harmony and dependence on one another, so that, as St. Paul said long ago, "if one member suffer, all the members suffer with it," and if one part is starved, the other parts frequently, if not always, suffer privation with it. The serum-albumen being, then, deficient in the blood, it is not at all astonishing that the albuminous constituent of the colouring matter should also be below par.

The symptoms of albuminuria are, therefore, those of anæmia, and we often suspect the presence of the disease from the mere look of the patient before we have addressed a question to him or applied a single instrument of physical diagnosis. There is not only paleness from the general want of blood, but there is a greater tendency to œdema than in other forms of anæmia, so that the face is not only pale, but puffy, pasty, or doughy-looking, with a tendency to swelling about the lower eyelids. The ankles and shins are frequently œdematous and pit on pressure, and there may also be accumulations of fluid in one or other of the serous cavities. These appearances in a patient at once arouse a suspicion of albuminuria, and we proceed to test them by examining the urine. In a state of health this secretion should be absolutely free from albumen. We detect the presence of this abnormal constituent in two ways : 1st, By boiling; and, 2nd, by adding nitric acid. On boiling urine containing albumen, coagulation takes place, and according to the quantity present we have either a faint haze giving an opalescence to the liquid, a heavy coagulum, or any intermediate condition between these two. There are some fallacies in this test, however, which require attention, for ignorance of them may lead us to imagine that there is no albumen when it is really present, or to fancy it there when the urine is completely free from it. The first fallacy is that serum-albumen forms compounds both with alkalis and acids, to which the names of alkali-albumen and acid-albumen have been given respectively. Now neither of these compounds are coagulated by heat, and although serum-albumen itself is readily coagulated by boiling, yet if acids or alkalis are present when we begin to heat it, the very warmth of the liquid, as we gradually raise its temperature, causes the albumen to combine with the acids or alkalis and form acid-albumen, or alkali-albumen. Thus it may happen that by the time we reach the temperature at which the albumen should be precipitated it is no longer present in its original condition, its combinations being already complete.

Thus, if the urine be very strongly acid, or very strongly alkaline, we may get these compounds formed, and then heat produces no coagulation, although albumen is present. We therefore ascertain the reaction of the urine by means of litmus paper before applying heat. As the tissues of the body are all alkaline, it is very unlikely that the urine will contain so much free acid as to produce acid-albumen, and indeed such a condition is almost never found except in persons who have been taking large quantities of mineral acids. In such a case we would add sufficient alkali merely to neutralise the acid before we boiled the urine, but this is so rarely necessary that we generally disregard this source of error. Excessive alkalinity, however, is not so uncommon, and we very frequently have to add a few drops of acetic acid to the urine so as to render it slightly acid before boiling.

This addition of acid, however, serves a double purpose, and not only enables us to detect the albumen more certainly when it is present, but prevents us from mistaking other things for it when it is absent.

In some urines alkaline phosphates or carbonates are precipitated by heat and may be mistaken for albumen, but a drop or two of acetic or nitric acid prevents their precipitation, or if added after they have already been thrown *down dissolves them* again and causes the urine which they have clouded to *become clear again.*

It is thus evident that heat alone without acid is an insufficient test for albumen, and nitric acid alone without heat is also unsatisfactory and may be deceptive; but nitric acid coagulates albumen and causes a haze or coagulum just like heat. If the urine contain a large quantity of urea, the nitric acid may cause the formation of a crystalline precipitate of nitrate of urea, which is, however, but rarely mistaken for albumen. But if urates be present in large proportion, one is much more likely to fall into error, for the nitric acid drives out uric acid from its combinations with soda or potash, and free uric acid being much less soluble than urates a precipitate is formed which is much more likely than the urea one to be mistaken for albumen. A little heat now applied to the urine causes either urea or uric acid to redissolve, and the urine clouded by them to clear; but it has no effect on the haze or coagulum produced by albumen.

In testing for albumen, then, the best method of proceeding is to allow three or four drops of nitric acid to trickle down the side of the test tube containing the urine. If no haze appears we may conclude that the urine is free from albumen. It won't do to pour in acid until the test tube is half full, for it is possible that if only a little albumen is present it may be converted into acid-albumen and dissolved by the concentrated acid. If a cloudiness appears we must not at once conclude that it is due to albumen, but must warm the urine over a spirit lamp. If it is really albuminous the opacity will remain, but if the cloud is due to urea or uric acid it will disappear.

So much for the symptoms of albuminuria, which are paleness and pastiness of the face, a tendency to œdema and dropsy, complaints of weakness, shortness of breath, dyspepsia, nervous symptoms, and, I may add, occasionally palpitation.—*Practitioner*, *Nov.* 1875, *p.* 352.

31.—GALLIC ACID IN THE TREATMENT OF ALBUMINURIA.

By Dr. J. T. Jamieson.

The following is from an article in the American Practitioner :—I wish to call attention to the use of gallic acid in the treatment of albuminuria as a sequel to scarlet fever, with which, in a few cases, I have met with marked success. My experience with the remedy has been as follows :—

In my first case, occurring in a boy aged about twelve years, the symptoms were very severe. There was œdema of the face and lower extremities, but no effusion into the thoracic or abdominal cavities; violent headache; blindness; there had been four or five strong epileptiform convulsions; urine was scanty and contained blood, resembling exactly water in which fresh beef had been washed, and coagulating about one-half on testing with heat and nitric acid. To relieve the cerebral symptoms, a blister was applied to the neck, sinapisms to the extremities and lumbar region, cold to the head, and two or three doses of a mercurial with bitartrate of potassa. This was followed by iodide of potassium and a teaspoonful of a saturated solution of gallic acid every two hours. The acid was given in this manner for five days and nights in succession, the patient rapidly improving under its use, and the urine becoming more copious and less bloody. It was continued for twenty-two days, only at longer intervals, and at that date the urine when tested manifested the slightest possible trace of albumen, although the boy at this time was around the house and apparently perfectly recovered, having been so for a number of days. The tinct. ferri chloridi was given in small doses, and completed the cure.

My second case occurred in a girl about six years of age. The eruption was very livid and the skin had desquamated. The child recovered well from the fever, and was about the house. She went into a cold room to play with other children, and a day or two after the face became œdematous; there

was pain in the head; slight fever; urine quite bloody, and on testing in the usual manner presented considerable coagulation. The patient was put upon a saturated solution of gallic acid, a teaspoonful every two hours. In seven days the urine was free from albumen and copious in quantity, and the child seemed well, with the exception of debility, for which the muriated tincture of iron was prescribed. About ten days after this, in consequence of fresh exposure to cold, there was a slight relapse, the urine becoming again bloody and the face puffed; but on resuming the gallic acid for a few days these symptoms speedily subsided and the recovery became permanent. In this case the gallic acid was administered unaccompanied by any other medicine, except an occasional dose of castor oil to regulate the action of the bowels.

Remarks.—The treatment hitherto generally adopted in this affection has been that of acting derivatively on the bowels by means of mercurials, followed by such diuretics as digitalis, sweet spirits of nitre, acetate of potash, &c.: but if future experience should confirm the efficiency of gallic acid, I cannot but think we shall possess a remedy superior to any of the above. The gallic acid if I understand its action aright, enters the blood unchanged, and unchanged is carried directly to the congested and inflamed capillaries of the secernent portion of the kidneys, acting as an astringent and tonic upon them, promoting their contraction, and thus arresting the exudation of red blood corpuscles and promoting the normal secretion of urine. I have seen no unpleasant effects from its administration as freely as above represented. It does not disturb the stomach nor interfere with the appetite or digestion, but it does tend to constipate the bowels somewhat, rendering necessary the occasional use of a relaxative.—*Medical Press and Circular, Feb.* 2, 1876, *p.* 104.

32.—ON A CASE OF DIABETES CURED BY THE SKIM-MILK DIET.

By Dr. Scott Donkin.

At a meeting of the Clinical Society of London, held on December 10th last, Dr. Scott Donkin brought forward a case of diabetes cured by the use of skim-milk. The patient, who was shown to the Society, was a hale, robust-looking man, forty-five years of age, a carman by trade. He had an accident three years ago, suffering a blow on the head, which laid him up for awhile. At the end of June, 1875, he had another accident: his cart coming into collision with a cab, he fell between the shafts, and was dragged some distance and bruised, but not severely injured. Soon afterwards he began to suffer from polyuria, with great debility and much thirst, but the practitioner whom he consulted did not recognise the case as one of diabetes, and sent him into the country for change of air. There, on an unrestricted diet, he grew rapidly worse, and, as the existence of diabetes was suspected, he was sent back to London. On October 6th he was first seen by Dr. Donkin, having then suffered from these symptoms for six weeks. At that time he was passing daily from twelve to fourteen pints of urine, of sp. gr. 1045, containing a quantity of sugar, which was estimated, by means of Duboscq's polarising saccharometer, at twenty-eight grains to the ounce. There was urgent thirst, a parched mouth, dry skin, and great voracity, and the sight was impaired. There was loss of sleep from the frequent calls to micturate at night, great debility, and loss of flesh, but no other complications. The patient was at once (on Oct. 7th) put on skim-milk diet, seven pints a day, without other food. Two days later the quantity of milk was increased to eight pints a day. The treatment was followed by a rapid diminution in the quantity of urine, and on the fifth day from its commencement only four pints and a half of urine were passed. On October 14th, or seven days from the commencement, the specific gravity of the urine was 1010, and there was no sugar to be discovered in it. The health had greatly improved, the patient slept well, having no calls to pass urine at night. Nine

pints of milk were now allowed per diem, a part being given as curd. On November 5th, three-quarters of a pound of mutton-chop was added to the diet, the skim-milk being reduced to six pints. On the 12th the specific gravity of the urine was 1012, and he was allowed an additional chop. On November 18th, or six weeks from the commencement of the treatment, the patient's health was restored and there was no sugar in the urine, and he was allowed some fish. On the 21st he resumed his occupation, which he has since continued. On December 3rd he was seen again; he came then free from disease. On the 10th his urine was of sp. gr. 1017; no sugar could be discovered with Fehling's solution, and the quantity was from four pints to four pints and a half per diem. He was now allowed some tea and a little pale brandy. In remarking on the case, Dr. Donkin observed that some might be inclined to regard it as one of traumatic origin, but this was not his opinion. The great quantity of sugar passed and the rapid emaciation showed the case to be a very severe one. It was a fact of great importance that the copious formation of sugar was arrested under a diet which contained eight ounces of milk sugar per diem, that being the estimated quantity in the amount of milk taken, and it corroborated the observation which he had previously made, that lactose does not cause an increase in diabetic sugar. Dr. Donkin also gave some particulars of another case under his care—a young lady ten years of age, who for three months had been suffering from great thirst and frequent micturition. The practitioner who was consulted found the case to be one of diabetes. The specific gravity of the urine was 1040, and it contained much sugar. He ordered a meat diet and small quantities of Dover's powder. She still, however, suffered from thirst and occasional giddiness, and on October 2nd she was put on a diet of skim-milk, which she continued for ten days. This was followed by a rapid fall in the specific gravity of the urine, which reached 1010 on October 12th, when she came to London to consult Dr. Donkin. The same treatment was continued, and on November 6th she was seen by Sir T. Watson, who stated that the specific gravity of the urine was 1015, and it contained neither sugar nor albumen. Since that time the patient had continued well, and on December 6th the specific gravity of the urine, which had varied from 1014 to 1016, was 1023 (the quantity of urine being less than usual); the child was in good health and spirits, and the diet was being gradually altered towards an ordinary one. Dr. Donkin remarked that these cases show in a striking way the arrest of the disease by the treatment when it is applied in the early stages, before the disease has been fully established or has produced irremediable lesions. The fact that the method was so often applied only as a last resource, when all other measures have failed, must be borne in mind in estimating the value of the treatment; this was especially the case with hospital patients, who so often apply for relief when broken down and worn out by the disease, and hence the frequent failure to obtain any successful result.—Dr. Coupland enquired whether the patient was of temperate habits, or was in the habit of taking malt liquors.—Dr. Donkin replied that he was very temperate and moderate. —Dr. Glover suggested that the urine should be examined by the secretaries in order that confirmation might be given to the remarkable facts of the case. One very striking fact in the history of the case was that the patient had actually, as he had ascertained by questioning him, lived solely on skim-milk for a month. Moreover, he was restored to perfect health. Now if any other remedy were introduced which produced half so remarkable effects, we should think it a very important addition to the pharmacopœia. The second case was even more astonishing, as the disease in old people may often be held in check for a long time by careful dieting, but in early life they were usually much less amenable to treatment.—At the suggestion of the chairman, Dr. Glover and Dr. Southey made an examination of the urine, and reported that it was entirely free from sugar.— *Lancet*, *Dec.* 18, 1875, *p.* 879.

SURGERY.

FRACTURES, DISLOCATIONS, AMPUTATIONS, AND DISEASES OF BONES, JOINTS, ETC.

33.—ON EXCISION OF THE ANKLE.

By James F. West, Esq., Senior Surgeon to the Queen's Hospital, Birmingham.

[Excision of the ankle has not hitherto been regarded with much favour for chronic disease of the ankle-joint.]

Resection of the ankle, or, in fact, of any other joint, is of course not justifiable until attempts have been made to remedy the joint-mischief by all the means at our disposal. Rest; immobilisation; counter-irritation, by blisters, iodine, or by the actual cautery; and, lastly, free incision into the joint and removal, if possible, of any fragments of loose necrosed bone,—must each, in succession, have been resorted to; while at the same time the patient's general condition has been to the utmost improved by fresh air, good living, and such tonics as iron, quinine, and codliver oil.

Still, after the adoption of all these measures, suppuration in and about the joint, pulpy degeneration of synovial membrane, ulceration of cartilage, and caries of the cancellous structure of the bones, will in some cases continue, and then arises the question, Shall the leg be amputated by Syme's or Pirogoff's method, or shall the patient have the chance first offered to him of keeping his foot, even although this will necessitate a somewhat difficult and tedious operation and a protracted convalescence?

I entertain a strong opinion that by adopting Ollier's (of Lyons) mode of subperiosteal resection, the future history of excision of the ankle will be far more satisfactory than the past has been. Experience has also shown that partial resections had better be given up, and that it is better to excise the entire joint than to limit the operation to the removal of the obviously diseased portions of it. Attention to the following measures during the after treatment will also add greatly to the number of successful cases:—1. Early and complete immobilisation of the limb. 2. The use of the anterior iron bracketed splint, by means of which, as after resections of the knee, the leg can be suspended in a Salter's swing, and the lateral openings formed in the joint dressed without much disturbance of the parts. Lastly, the employment of drainage-tubes, passed from one side of the ankle to the other, by which pus and carious débris may be removed, and through which the wound may be daily washed out by some weak disinfecting solution, as carbolic acid or Condy's fluid.

The originator of resections, as of so many things that still hold good in surgery, was Celsus, as we learn from this passage: "Ideo quod excedit, abscindendum est." But the first to apply this principle to the ankle was an English provincial surgeon, Hey, of Leeds, who in 1766 resected the lower ends of the tibia and fibula for compound dislocation; and since that time resection of the ankle has frequently been performed under similar circumstances with such good results that few would question the propriety of performing resection for compound dislocation of that joint, rather than of at once recommending amputation of the leg. Hey's success led to the adoption of the operation for chronic articular disease by Moreau, and *in 1792 he first* removed the lower ends of tibia and fibula for disease.

[Many surgeons have written about and performed this operation, but per-

haps no paper is of so much value as that by Mr. Hancock (*Retrospect*, July to Dec., 1867, p. 185.]

In this paper Mr. Hancock referred to 19 successful cases of his own, and mentioned that Heyfelder had given 26 examples of this operation, of which 5 died, 1 suffered consecutive amputation, and the rest proved successful; and that of Jaeger's 24 cases 23 proved successful and only 1 died.

[A lad, sixteen years of age, injured his ankle, by a jump from a height of ten feet. Chronic disease of the joint resulted.]

The lad's general health being good, and the case seeming favourable for resection, the operation was performed as follows:—Lateral incisions were made parallel to the tibia and fibula; the fibula was first divided with the chain saw, then the tibia with Butcher's saw, and lastly the astragalus with Hey's saw. The articular surfaces of all the bones were found to be devoid of cartilage and superficially necrosed. The operation was performed by Ollier's subperiosteal method, and, Esmarch's bandage having been used, it was quite bloodless. No tendons were divided. A drainage-tube was inserted between the bones of the leg and foot, and the limb at once immobilised with bandages and a gutta-percha splint. Chloroform was used, and well borne by the patient.

[In Dec. 1875 this lad was able to walk a distance of four or five miles without inconvenience.]

My manner of making the incisions in this case was almost identical with that described and recommended by Hancock, except that the lateral incisions were not carried forwards and downwards on the tibial side as far as the projection of the inner cuneiform bone, nor on the fibular side to within half an inch of the base of the outer metatarsal bone; such free incisions are, in my opinion, rarely necessary, and further tend rather to lead to subsequent suppuration among the tarsal bones. Lateral incisions are far preferable to the semicircular incisions which I have seen employed at the Leeds Infirmary and elsewhere, inasmuch as with the former all the tendons are saved, and no vessel of importance is divided. Excision of the ankle is one of those operations in which the advantages afforded by Esmarch's bandage are most appreciated. Not only is the patient free from hemorrhage, but in consequence of the parts not being covered with blood, we can see clearly what we are doing, and need only take away as much of either of the bones as is absolutely diseased, and if on taking one section of bone caries is still evident, we can take slice after slice of bone away until we get to sound osseous tissue, without having our view of the joint cavity in any way obstructed. The joint having been opened on the outer side and the fibula exposed, I separate the periosteum from it with the raspatory, and then cut off the lower end of that bone with the chain-saw. I prefer the chain-saw because it can readily be passed round the bone, and can be kept close to it, so as not to endanger the peronei tendons, and hence I think it presents greater advantages than Hey's or Butcher's saw. I then divide the internal lateral ligament, keeping close to the bone, so as to avoid the flexor tendons, and the posterior tibial artery, push the lower end of the tibia through the fibular opening, denude the periosteum, and cut the articular surface and inner malleolus off with Butcher's saw, and lastly with Hey's saw I remove the upper part of the astragalus. Should that bone be extensively diseased it should be freely gouged, and the carious or necrosed portions cleared out with the osteotrite. In some cases it has been successfully removed entire, along with some portion of other of the tarsal bones, as in Mr. Swain's case of a boy, aged fourteen, for whom at various times he excised the ankle-joint and the bones of the tarsus for caries; but, as a rule, when more than one of the tarsal bones is largely affected with caries, it will be better to amputate at once by Syme's method. Pirogoff's operation, though recommended by some surgeons, is not, as I have before proved, suitable in such cases, in consequence of the great risk of caries recurring in the remaining portion of the os calcis.

I hold that complete resection of the joint is better than partial, and in that respect I differ from Mr. Bryant, who says, "Resection in cases of disease is very hazardous, except in partial resection of the fibula, which is

generally successful." Now, having myself tried partial resection of the fibula more than once, and especially recently on a boy aged sixteen, whose disease seemed limited to that bone, and having had subsequently to submit the patient to secondary amputation, I cannot agree with Mr. Bryant's opinion, and I think he will modify it when he has had some personal experience of complete resection of the ankle, which up to the present time he admits he has not had.

Immobilisation of the limb before the patient leaves the operating-table I deem to be essential. I care very little whether that condition be obtained by a gutta-percha or leather case or by a starch or plaster of Paris bandage with suitable windows on either side of the ankle, but the immobilisation must be thorough, and the apparatus, whatever it is, should not, if it can be avoided, be disturbed for at least a couple of months. The limb may, with comfort to the patient, be suspended by one of Bartleet's or Watson's anterior splints in a Salter's swing.

As new bone is often formed rapidly in young subjects, and concomitantly there is an abundance of exudation material about the ankle, it is advisable in the course of two or three months to give support and compression to the new tissues by means of a piece of sheet lead one-eighth of an inch in thickness, retained *in situ* by careful bandaging.

Another feature of the operation of great value, to my thinking, is the preservation of the periosteum by means of careful employment of the raspatory, so as to avoid slitting that membrane. The instrument should be kept as close to the bone as possible, so as to detach some of the bone granules along with the periosteum.

The idea of regenerating bone by this means, so generally attributed to Ollier, of Lyons, belongs, as Giraldès candidly points out in his "Mal. Chir. des Enfants," to our countryman Goodsir, who, as early as 1845, discovered the fact that by preservation of the periosteum with the subjacent and still adherent fine particles of bone new bone could be formed.

Preservation of the length of the limb and greater consolidation of the parts, both points of immense importance as regards the patient's future condition, are gained by this method of superiosteal resection, and I cordially echo all that has been said in its favour by Professor von Langenbeck in his work "On the After-results of Joint Resections," and not less by another great authority in the treatment of diseases of joints, Dr. Sayre, of New York. Drainage-tubes applied at the time of resection, so that the joint cavity may be kept free from discharge, and thoroughly cleansed daily with some weak disinfectant solution, are small, though not unimportant, matters to be attended to in the after-treatment of the case.— *Lancet*, *Dec.* 18, 1875, *p.* 868.

34.—DEMONSTRATIONS OF ANTISEPTIC SURGERY, BEFORE MEMBERS OF THE BRITISH MEDICAL ASSOCIATION IN THE OPERATING THEATRE OF THE ROYAL INFIRMARY, AUGUST, 1875.

By Joseph Lister, Esq, F.R.S., Professor of Clinical Surgery in the University of Edinburgh.

[The first case was one of aneurism of the femoral artery, and was an illustration of the effects of ligature of an artery, in its continuity by means of prepared catgut applied antiseptically.]

The operation was performed on the 23rd of June and the wound was absolutely skin-whole in fifteen days without the occurrence of any suppuration at all. [Mr. Furneaux Jordan, of Birmingham, was now kind enough to come forward and examine the patient, verifying the fact that there was no pulsation in the artery at the groin. Mr. Lister then proceeded.]

The immediate object of the operation has therefore been attained—the *vessel has* been permanently obstructed at the part tied; and this has been *done without* the occurrence of any suppuration, and by a mode which, I

think, we may venture to say, involves no danger whatever, provided it be properly carried out. The two great risks of an operation like this are, of course, secondary hemorrhage, and diffuse suppuration in the cellular tissue around the peritoneum; and both of these are securely guarded against by proceeding in this manner. I believe myself that this is a pretty perfect method of obstructing a vessel in its continuity; I do not see that we can wish to have it improved upon. I therefore regret extremely to find that it is still distrusted in various quarters, even by those who use catgut for the ligature of arteries in ordinary wounds. They do not trust it for tying arterial trunks in their continuity. I regret this the more, because I feel it is to a certain extent my own fault. When I first published on the subject, I was not aware myself of the proper mode of preparing the catgut. I had prepared it right, but by a mere accident. I described the mode of preparation in the Lancet (April 3, 1869), as steeping the catgut in a mixture of carbolic acid and oil. It so happened that the carbolic aicd which I used was liquid carbolic acid, so called—that is to say crystallized carbolic acid, liquefied by the addition of water. Now, this water makes all the difference in the world. When oil is added to this liquid carbolic acid, a considerable portion of the water is deposited in the form of very fine particles, which are suspended in the oil; and it is this mixture—this emulsion, if we may so call it—of oil and water which causes the remarkable physical change in the animal tissue of which catgut is composed, that alone renders it fit for our objects. The tissue of the catgut in the ordinary condition is utterly unfit for surgical purposes; as slippery, when moistened, as a piece of intestine in the dead-house—when you tie it in a knot, it slips with the utmost ease. But after it has been steeping in the emulsion of carbolic acid, water, and oil, for a certain length of time, it undergoes a physical change, which I am quite at a loss to explain. As the tissue lies steeping in this mixture, the first effect is to moisten it somewhat; then, as time passes, after about a week, you find that, instead of becoming softer, more swollen and more opaque, as you would expect, it is, on the contrary, growing less opaque and beginning to shrink; and in about three months, though still softer than dry catgut, it is comparatively firm and quite transparent. Now, if you take a fresh piece of dry catgut and put it into this same sample of the preparing liquid, you will find the second piece become in the first instance partially moistened like the first; a fact which renders it inexplicable to me, why the former piece should have undergone what looks like a partial drying. But whatever the explanation, the all-important fact is this, that after the catgut has been thus partially dried, so to speak, in this moist liquid, it is now no longer liable to be made slippery by being steeped in water or the animal juices at the temperature of the body: it is indeed rendered softer and somewhat opalescent, but a reef-knot tied upon it holds better than one on waxed silk. I repeat, when I first published on the subject, I was not aware of this circumstance. I had got the catgut properly prepared, but it was by mere accident that the water which is essential to the process was present in the mixture that I used; and, ignorant of its importance, I omitted to mention it in the description which I gave of the mode of preparation; whereas mere steeping of catgut in a solution of dry carbolic acid in oil, though it of course makes it antiseptic, leaves it perfectly unfit for use as regards its physical properties. When I found out my mistake, I sought to remedy it by insisting, in subsequent publications, upon the importance of the presence of the water in the preparation of the catgut; but I never stated, as I do now, that I had originally described an untrustworthy method. I very much regretted this bad result of what turns to have been premature publication; and I earnestly hope that this public confession of my mistake will have the effect of preventing any further bad consequences from it.

The catgut does not spoil by being kept a long time in the preparing fluid of oil, carbolic acid, and water. Here is some that was put in six years ago last month. It is now just as good as ever. Thin as it is, I cannot break it with any reasonable force. If you were going to tie the external iliac, you would use a thicker piece than this; partly, in order that it may stand any strain to which it *could be* reasonably subjected in the act of ligature, and

partly that, a longer time being required for the absorption of the more substantial material, it may remain longer as a mechanical barrier to the force of the circulation.

In this point of view there is another important advantage possessed by catgut properly prepared, viz., that it is much less rapidly absorbed than that which has been for a shorter time in the preparing liquid.

I would strongly advise any surgeon, who proposes to ligature an artery in its continuity with catgut, to test for himself the quality of the article; since those who sell it are tempted, if their stock of old catgut has run out, to supply that which has not been long enough prepared. In order to ascertain if it is trustworthy, a piece should be steeped for an hour in water about the temperature of the body, as in a vessel at a suitable distance from the fire. If then a reef-knot tied upon it does not slip, it is fit for use. And it will be well for the surgeon to keep a stock of the material for special purposes like these, testing it in the first instance in the manner described, after which he will be sure that, being still kept in the preparing liquid, it will be at least equally good at any subsequent period. If these points are attended to, there will be no further complaints about untrustworthiness of the catgut.

When it is requisite that the cord should be able to withstand all the strain to which the human hands can subject it, as, for example, if it be used for the pedicle in ovariotomy (in which case, I may remark, the pedicle would have to be well subdivided), the material must be of specially strong quality to begin with. Catgut consists of the peritoneum, together with muscular fibres, of the small intestine of the sheep; and the common kinds are either the entire tube of the gut, or longitudinal strips (according to the thickness required) simply twisted, dried, and subjected to sulphurous acid vapour, or other chemical agents. But for special purposes, as, for example, the manufacture of fiddle-strings, the cord is made of several narrow strips twisted together, and is then very much stronger. Such catgut can be obtained of the musical-instrument makers, but is of course then unprepared in our sense, unfit for surgical purposes, and must be kept in the preparing liquid for a due length of time. For the sake of those who wish to prepare catgut for themselves, I may repeat here the proportions which I have found the best for the purpose. Add one measure of water to ten parts by weight of crystallized carbolic acid, mix and add one measure of the mixture to five measures of olive oil, in a suitable jar or wide-mouthed bottle; then at once introduce the catgut, the hanks being opened up to allow access of the liquid to them; cover, and set aside in a cool place. Some water is gradually precipitated to the bottom of the vessel, and it is necessary to prevent any part of the gut from coming in contact with this precipitated water. A simple way of ensuring this is to put in as many marbles as will cover the bottom of the vessel.—*Edinburgh Med. Journal, Dec.* 18, 1875, *p.* 485.

35.—ON PROF. LISTER'S TREATMENT OF WOUNDS AND ABSCESSES BY THE ANTISEPTIC METHOD.

By Thomas Smith, Esq., Surgeon to St. Bartholomew's Hospital.

[Both Mr. Smith and his house surgeon, Mr. Vernon, have studied antiseptic surgery under Prof. Lister's and Mr. Annandale's personal instructions.]

The theory, or, one may now say, the facts on which Mr. Lister's antiseptic treatment rests are as follows:—

1st. That in the dust of the atmosphere, and on matter with which it is in contact, there are the germs of minute organisms which, under favourable circumstances, induce putrefaction in fluids and solids capable of that *change*, in the same manner as the yeast-plant occasions the alcoholic *fermentation* in a saccharine solution.

2nd. That putrefaction is not occasioned by the chemical action of oxygen or any other gas, but by the fermentative agency of these organisms.

3rd. That the vitality or potency of the germs can be destroyed by heat, and by various chemical substances, which we call, in surgery, "antiseptics."

Now, I am not going to ask you to believe these statements on my authority, but I will shortly refer to the results of experiments performed by Pasteur, Lister, Sanderson, Tyndall, and others, which justify the above conclusions.

It is scarcely necessary to state that organic fluids, like milk, urine, and blood, infusion of meat, &c., if kept in contact with the air at ordinary temperatures, will ere long decompose or putrefy, and will give evidence of putrefaction by turbidity (if the fluid be originally clear), by the evolution of offensive gases, and by the development within them of bacteria.

Again, I need do no more than remind you that prolonged boiling will not of itself preserve such fluids from putrefaction. Yet any of these or similar fluids may be kept free from putrefaction for an indefinite time, in spite of free access of the atmospheric gases, provided that the fluid has been boiled at the outset to destroy any organisms in it, and that the vessel containing it has been thoroughly purified by heat, and that the dust of the air is excluded. The exclusion of the dust may be effected in various ways. In some of Pasteur's first experiments it was done by having the neck of the flask which contained the liquid drawn out by aid of heat into a fine tube bent at various angles, in which form, though open at the end, and allowing perpetual entrance and exit of air, it arrested all particles suspended in it, and the urine or other fluid which was the subject of experiment remained permanently unaltered. Or, again, the same object may be attained by having the mouth of the flask plugged with a mass of purified cotton wool, which effectually filters of its dust the air that enters the vessel in consequence of the condensation which alternates with expansion in the diurnal changes of temperature. But if the neck of the flask is broken short in Pasteur's experiment, or the plug of cotton-wool removed, organisms are sure to show themselves before many days have passed. Even more striking is the method adopted by Mr. Lister, who decants the boiled organic liquids into wine-glasses purified by heat, and each covered with a glass cap similarly purified and a glass shade, scrupulous care being taken to avoid the entrance of dust during the process of decanting. Neither cap nor shade fits closely, so that a constant interchange takes place between the external air and that in the wine-glass, yet the double protection afforded by the cap and shade effectually excludes dust, and the result is, that although the organic liquids gradually diminish in bulk by evaporation, and in the course of months dry up altogether, no organisms make their appearance from first to last, nor does putrefaction or any other fermentative change occur. If, however, the glass shade and cap are removed for a few minutes and replaced, fungi or bacteria soon show themselves. But he has found that if the glass cap be only lifted for a second or two in an ordinary apartment free from draughts there is practically no risk of the entrance of any organism in the short period of exposure.

Further, it has been shown by Pasteur and other observers that it is by no means essential to the success of such experiments that the organic liquids should be boiled, but that when circumstances admit of their being withdrawn uncontaminated from their natural receptacles, such as the urinary bladder, the bloodvessels, the udder of the cow, or the shell of a fresh-laid egg, they will remain free from organisms and from putrefaction when kept in pure vessels and protected from dust.

It has also been discovered that impure air will purify itself by mere subsidence of its dust. Pasteur long ago proved that putrescible fluids could be kept free from putrefaction in air taken from cellars free from draughts, when the solid particles of the atmosphere had had time to deposit themselves by subsidence; and Prof. Tyndall has recently subjected air purified by being kept at rest to very searching tests to ascertain if it will excite putrefaction in putrescible solutions. He has found that solutions of meat, cheese, turnip, &c., first *subjected* to a high temperature, can be kept free from *putrefaction for an indefinite* time exposed to the air-closed boxes that have

been kept at rest a day or two, to allow the dust to subside, precautions being taken to prevent the said dust rising again by coating the inside of the box with glycerine. The same experimenter has demonstrated the fact that the air which has been thus rendered incapable of exciting putrefaction—*i.e.*, aseptic—is also optically pure: that is, that there are no particles or motes to be detected in it when illuminated by a beam of electric light in a darkened room.

I think, then, we are justified in concluding that in the dust of the atmosphere there *are* such things as fermentative particles, organisms, germs, or whatever you like to call them, and that these, under favourable circumstances, induce putrefaction in fluids and solids capable of the process; that without these germs putrefaction and the formation of bacteria does not take place, and, finally, that these germs can be destroyed or removed from the atmosphere by the various means that I have above described.

Let me here remark, as having an important bearing upon Mr. Lister's practice, that in the case of those fluids that have been kept free from putrefaction by any of the above described means, the addition of the smallest drop of ordinary water, or the contact of a glass rod that has not been specially treated to render it aseptic, will almost certainly excite putrefaction, though all other prescribed conditions are scrupulously carried out to prevent its occurrence.

On the other hand, Mr. Lister has found that when any portion of apparatus used in investigations on this subject cannot conveniently be purified by heat, the object may be attained by washing the glass or other material with a strong watery solution of carbolic acid, and drying it with a carbolised rag, and in the course of a long series of experiments he has invariably found this antiseptic agent as efficacious as the flame of a spirit-lamp in preventing the growth of organisms and the occurrence of putrefaction.

Mr. Lister's object in the treatment of wounds and abscesses is to exclude from them these germs of organisms that float in the atmosphere and are the causes of putrefaction, and the means he employs for effecting this purpose he recommends, not as the best that can be used, but as the best that he has been able up to the present time to devise; and although Mr. Lister considers the truth of his theory incontrovertible, yet he does not claim to have brought his practice to perfection.

Mr. Lister claims for his plan that when it can be carried out with due care and proper observance of details, he can, as a rule, secure that an open wound should heal after the manner of a subcutaneous injury—that is, without inflammation or constitutional fever, and for the most part without suppuration; while, if suppuration occurs, he secures that it shall not be putrefactive—that is, accompanied by the changes that we consider evidences of putrefaction, such as the formation of bacteria and the evolution of fetid gases.

In the treatment of abscesses by the antiseptic method, Mr. Lister believes that he has effected an entire revolution in the course of the disease after the cavity has been opened. I may here mention that, along with many local advantages, the patient is said to be free from all danger of irritative fever as the immediate consequence, and from hectic at a later stage.—*Lancet*, *March* 25, 1876, *p.* 453.

36.—ON THE ANTISEPTIC TREATMENT OF CASES OF OPEN KNEE-JOINT.

By Dr. Hector C. Cameron, Extra-Mural Lecturer on Surgery, and Surgeon to the Royal Infirmary, Glasgow.

The recent discussions on antiseptic surgery have revealed a very general desire that the subject should receive further clinical illustration, and it is this consideration which encourages me to offer my experience in the matter. In the present paper are given the details of the cases of open knee-joint *which I have* treated by this means. The mode of procedure adopted in all *of these* was essentially the same, with the exception that, in the first case, *no drainage*-tube was used. The dressing was, on each occasion, conducted

from its commencement to its close under a spray of carbolic acid. The joint having been frequently and thoroughly injected with a watery solution of the acid (1 to 30), an antiseptic drainage-tube was introduced into the wound. Over this was placed a small piece of antiseptic gauze which had been wetted in a solution of the acid (1 to 40), and over that, again, one or two dry loose pieces of the same material. Outside all was fixed, by an antiseptic gauze bandage, a large square dressing, consisting of eight layers of antiseptic gauze, under the top layer of which was interposed a piece of thin macintosh.

Case 1.—*Case of open knee-joint; primary amputation of shoulder-joint; incised wound of face; traumatic delirium; recovery.*—Wm. B., aged thirty-two, was admitted into Ward 23 of the Glasgow Royal Infirmary, of which I was in temporary charge, on Aug. 23rd, 1873, having been knocked down by a passing train, as he was walking along a line of rails sixteen miles from Glasgow. On admission he was in a boisterous state of intoxication.

The right arm had been severed from the trunk. About three inches of the humerus remained, the greater part of it being bare and stripped of covering. The soft parts had been torn away internally as high as the apex of the axilla, and externally from a little below the point of the acromion process. There was an incised wound about an inch and a half in length beneath the left eye, exposing the malar bone. Over the right knee-joint, a little below and to the outer side of the patella, was a lacerated wound about two inches and a half in length. My finger, introduced into that wound, passed readily into the knee-joint, and it also discovered the fact that there was considerable undermining of the soft parts, downwards towards the leg and backwards into the popliteal space.

The patient having been put under chloroform, the head of the humerus was disarticulated and a quantity of torn muscle cut away. The principal vessels, which had been tied before admission with silk ligatures, were ligatured higher up with antiseptic catgut and the vessels cut off below. All the intricacies of the wound were now carefully and thoroughly washed with a watery solution of carbolic acid (1 to 20), and the usual dressings applied under a spray of the acid. A large raw surface was left from the deficiency of the soft parts.

The open knee-joint was next dealt with. Under the spray it was injected freely and repeatedly with a watery solution of the acid (1 to 20). Two antiseptic stitches were introduced and the usual dressings applied. A piece of Gooch's splint was placed at the posterior aspect of the limb, extending from the upper part of the thigh to below the middle of the leg. The wound over the malar bone was injected, stitched and dressed antiseptically.

During the night the patient proved very restless and tore off the dressings from the shoulder and face. They were soon reapplied by the house-surgeon, but were again removed by the patient. In the morning (Aug. 24th) both wounds were exposed. In his struggles he had also broken the splint placed at the back of the knee into two pieces, but the dressings were not seriously disturbed. His pulse was 96, and his temperature 100·2°. Antiseptic dressings were not reapplied to the shoulder and face, as they had been off nearly the whole of the night. The knee was dressed under the spray. There was found to be considerable effusion in the knee-joint (I had used no drainage-tube) and under the undermined tissues. Little or no blood or other fluid had escaped. I therefore removed the stitches and introduced my finger, previously carefully washed in the solution, into the wound, giving exit to a considerable quantity of bloody serous fluid. Dressings applied as before, and a new splint placed at the back of the limb. Pulse in the evening, 114; temperature, 102·4°. On Aug. 25th the discharge from the shoulder had a distinctly putrefactive odour, and it was ordered to be washed and dressed with Condy's fluid and water, changed frequently. Occasionally he removed the dressings, at other times he allowed them to remain. The knee had furnished a considerable amount of bloody oozing, but there was no redness, and only slight swelling. The wound had gaped and appeared to be draining freely. He was still delirious and now full of hallucinations, although *not so boisterous* as he had been. For the next three days his *mental condition showed* typically the usual characters of traumatic deliri-

um. The shoulder soon began to suppurate freely. The wound over the malar bone, which had been left quite bare, healed by first intention. The knee, at first dressed daily, was found to furnish only some serous oozing, and to be free from redness, pain, and swelling. The pulse continued quick, but of good strength. Two abscesses formed in the neighbourhood of the shoulder, from bagging of the discharge, and were incised. The suppuration from the wound and these incisions was abundant, and in spite of the frequent changing of the dressings by the nurse (three times a day), had a distinctly offensive odour. After the fifth day the serous discharge from the knee was found so slight that it was dressed once or twice on alternate days only, and latterly every third day. About the fifth day also the delirium ceased, and he began to sleep better and to take more food. During the first five days he broke the splint on four separate occasions, and always exactly opposite the popliteal space. By the middle of September the wound of the knee was clearly quite superficial, and in a very short time soundly cicatrised. *From first to last it furnished no pus whatever.* The wound of the shoulder, which had been further increased by some sloughing of the integument, discharged freely for a considerable time; and its neighbourhood continued red, swollen, and tender to the touch. Ultimately the discharge diminished, and the large wound contracted and cicatrised, so that, when he was dismissed on Oct. 6th, it was quite superficial. He left the hospital at his own desire, but was still very weak. He ultimately got strong and well, the right knee-joint being perfectly flexible.

Remarks.—This case is an interesting one, not only as a recovery after severe and complicated injury, but as an example of three very different methods of healing going on side by side in the same individual. In such a case all must admit that the special behaviour of each separate wound is due to local and not to constitutional causes. The wound of the face healed by first intention; that of the shoulder by granulation and suppuration, with sloughing of bruised and lacerated tissue, and the formation of abscess in the immediate neighbourhood. The wound of the knee healed by neither the one plan nor the other. And yet this is a distinction which writers and debaters on this subject are not always sufficiently candid to draw. It is a too frequent reply to one who narrates the successful issue by antiseptic treatment of an open-knee joint, such as that just related, that an equally successful result is often obtained without any antiseptic dressings at all. And no doubt this is perfectly true. In a joint which has been purposely incised (as for the removal of a loose cartilage), or into which an accidental wound has been made by some such sharp-cutting instrument as a scythe, it is *possible* that a favourable result may be got by any carefully-applied dressing. Union by the first intention may occur there, just as it did in my patient's cheek. But should the wound of the knee-joint be allowed to gape, or should it be, as it too commonly is, of such a character as renders union by first intention impossible, there is no alternative except that it shall putrefy, granulate and suppurate, and that the patient shall run the usual well-recognised risk of the loss of his limb, or his life, or both. In the above case, matters were altogether different. In spite of severe complication, this open joint, although not entirely healed until after the lapse of three weeks, from first to last behaved like a subcutaneous injury, and externally furnished only a little clear, watery discharge. It may be viewed as the severest, in the first instance, of the three injuries from which the patient suffered; and yet it was the wound of the shoulder which caused him all this pain and occasioned the whole of our anxiety. To the shoulder, moreover, was directed all the "fussiness" which we displayed in the treatment of the case, for, while it was dressed three times a day, the dressings of the knee were changed, during the greater part of the time, only once in three days. Indeed, to an onlooker, unaware of the advantages of antiseptic treatment, this disregard of the knee wound would have been inexplicable, and might have been deemed culpable. And yet many would have it to appear that the success of the antiseptic method of treatment is entirely due to what they *are pleased* to call the extra care and attention bestowed on the wound. *Lastly, I would* remark that this case illustrates also the fact, with which I *am very familiar*, that a non-putrefying wound, so far from involving an

extra expenditure of time, trouble, and dressing materials, is, other things being equal, economical in respect of all of them.—*Lancet, Jan.* 22, 1876, *p.* 123.

37.—ON NON-UNION OF FRACTURES.

By H. O. Thomas, Esq., Liverpool.

So many varied methods have been practised for the relief of ununited fractures that the addition of another seems almost superfluous. The majority of the methods previously in use were attended with more or less risk in their application, and were all but impossible where the fractures were very close to or involved a joint; as for instance the non-union of a fractured condyle of femur, the head of the tibia involving the knee articulation, or tibia and fibula in the ankle. A case of non-union of the latter character came under my care in March, 1874.

Case 1.—The patient, Mr. John T., of Southport, was admitted into my hospital on the 16th of March, suffering from fracture of lower end of fibula and tibia. In this case there was so much abnormal motion between the fractured bones, permitting outward luxation of the foot, that the internal malleolus of the tibia nearly came in contact with the ground when the patient placed the weight of his body on the limb, and the fracture threatened to become compound. The deformity was easily reduced, but recurred with the slightest weight of the body to this extreme degree. As none of the usual methods could be applied in this case with any safety, I decided to try what effect a repeated application of percussion, with a rubber-protected mallet applied all round the articulation, would have. I accordingly commenced the treatment on the 20th of March, and applied percussion every second or third day for four weeks, desisting only for a few days when the parts became irritable. There was applied no splint or appliance whatever. From the first day of the operation there was a daily increase of consolidation and stiffness of the part, which continued until it resulted in a complete bony union in the space of four weeks; and on the 24th of May the patient was dismissed from the hospital quite cured, and free from this defect, the lower end of the tibia and fibula being considerably enlarged. In this case the non-union had existed for a period of twelve months.

This was the first instance in which I tried this method of treatment, but, finding it to answer beyond all my expectations, I decided to adopt it in future cases so as to give it a more extended trial.

Case 2.—On the 19th of March last I was consulted by one Harry B., of 30, Gradwell-street. This patient was suffering from a fractured leg, with non-union after sixty-five days' treatment. Assisted by my friend Dr. William Kelly the patient was placed under æther, and the tibia percussed carefully for ten minutes, the skin being protected during the operation with a layer of felt. The percussion was in this case followed by a considerable amount of swelling and irritation. The limb was placed in a suitable appliance, and at the expiration of four weeks complete consolidation took place. In this case percussion was only once performed.

Case 3.—On the 14th of May last I was consulted by John McA., who was suffering from a fractured leg sustained on the 23rd of February, 1874, on board the steamer "Caspian." He had been in the hospital at Halifax for eight weeks, and on his arrival in England, suffered from non-union, and consulted a specialist in this town, under whose care he remained for five months. At the end of that period he was for eight weeks a patient of one of the charities, and on the 14th of May last became an indoor patient in my hospital, when I performed percussion upon the tibia with the effect of consolidating the fracture in six weeks. This was percussed only on one occasion.

Case 4.—On the 1st of January last I was consulted by James K., a coloured man, who had his humerus fractured while steering one of the Dominion steamers in a storm. The patient was two weeks at sea before receiving any professional assistance. On his arrival at this port he consulted me, and the fracture was fixed in my usual appliance and continued in that condition *for two months with only* partial union. I noticed that while the union

seemed complete on making a lateral strain, it seemed to be quite loose if strained antero-posteriorly, imitating a hinge-joint. On the 28th of April I commenced to percuss the humerus, protecting the skin, and did so for four days, until there was a decided enlargement about the fracture. A rapid consolidation took place, which was complete in a month's time.

Case 5.—On the 15th of July last I was consulted by John McN., who fractured his leg on the 13th of October, 1874. He was for ten weeks an in-door patient of a charity, and for fifteen weeks more an outdoor patient. I found on examination that there was non-union, and decided upon operating. Having administered æther, the limb of the patient was well percussed with a copper mallet, rubber-faced. During the operation the patient partially recovered from the æther, and getting possession of the mallet, was almost successful in applying it to the writer and his assistants. We succeeded, however, in disarming him, and administered more æther, and finished the operation. The operation not being followed by much periosteal irritation, I repeated it every week for six weeks, but not under æther. The limb was retained in a suitable appliance for maintaining immobility, and on the 1st of September the limb was quite strong and well consolidated.

Case 6.—John Dark N., on the 15th of June last, fell into ship's hold and fractured his thigh, and was admitted into a charity for treatment, where he remained seven weeks; at the expiration of this period became an outdoor patient for three weeks, and, judging that the limb was becoming weaker, consulted me, when I found, on examination, non-union of the femur. I operated by my percussive method for a period of five minutes, producing a considerable degree of irritation. On the first day, and on every fourth day for three occasions, repeated the application in a milder form. During this time and up to the occurrence of consolidation he was well fixed in a suitable appliance with a satisfactory result.

Case 7.—In January last I was consulted by Peter G., who, while rescuing a fellow-workman from some machinery, had himself become entangled and suffered a compound fracture of the forearm (radius and ulna). The limb was carefully placed in a suitable appliance for a compound fracture, and was not disturbed for three months, when, on examination, I found that the radius had not united. I continued the treatment for two months longer, when, finding that the radius was still ununited, I commenced to percuss the humerus, carefully supporting the ulna from refracture, and continued the operation every alternate day on twenty-five occasions with the effect of greatly enlarging the radius. The forearm became much stronger, with some amount of consolidation, but wanting in firmness; and, as the patient had excellent use of the arm, I did not advise further interference. The failure of complete consolidation in this case arose from the fractured ends having become absorbed, and consequently wanting in length to come in absolute contact.

The cases in which I have practised the foregoing method, though not numerous, afford a fair test of its value, more especially the first case, in the treatment of which I did not anticipate any success. During my professional career (in my own practice) I have frequently had delayed union, but only one case of non-union, that being the case *last* reported.

As to the cause of non-union, I am by no means satisfied that it arises from the want of skilful treatment or insufficient immobility, as I have frequently noticed cases that were thoroughly fixed and carefully watched delayed in union; while in another case, though receiving less attention possibly, a rapid union took place.

I have tried various methods; manipulation and friction to the ends of the fractured bones, and passing a tenotome between the ends of the bones, but both of these methods are very unsatisfactory. I have also tried the method with bone, metal pegs, and screws, first having sawn the ends of the bones, using the screws or pegs with the intention of assisting immobility, and I am satisfied that the limb does better without the pegs than with them, having on frequent occasions operated without these accessories.

I have also operated on three occasions by a subcutaneous method, using *an instrument* which was chisel-shaped at the point, and file-cut on the rest *of the blade*, thus combining a knife and a rasp. This answered very well.

On one occasion also I operated upon a humerus where the bones were an inch short of being in apposition, and the limb had the appearance of an hour-glass contraction at the part where the bone was deficient. I operated upon this case by (what a ship-carpenter would call) "scarfing" the ends of the bones, with the result of a very excellent recovery.

Such a case as the latter would *not* be amenable to the treatment by percussion, but I am confident that the method of treatment by percussion will be found most useful for all ordinary cases of non-union, where the bones are in apposition and no interval of deficiency or any tissue exists between their ends.

Messrs. Khrone and Seseman, of London, supply a very neatly-constructed copper-headed mallet which I designed for these operations.—*Manchester Med. and Surg. Reports*, 1876, *p.* 27.

38.—NEW OPERATION FOR UNUNITED FRACTURES.

By Dr. MATTHEW HILL, Bootle, Liverpool.

[The operation described in this paper might be described as "A new Modification of Dieffenbach's Operation." The latter consists in opening up the seat of fracture and driving ivory pegs into the ends of the bony fragments with the intention of exciting inflammatory action and consequent throwing out of reparative material.]

In many instances, especially in the femur and humerus, it is considered "advisable not to employ the seton, but to pass on at once to Dieffenbach's plan," as being attended with less danger. Such a case is the one I have now to relate. Mr. W., æt. 35, a gentlemen of untainted constitution and active habits, had his thigh broken by a railway collision at Wigan on the 25th of December, 1874. He sustained a few other superficial injuries, and was exposed for some hours in the frost and snow. The fracture, which occurred at the junction of the middle with the lower third of the femur, was "simple," and oblique in direction. It was carefully attended by an experienced surgeon at Wigan, who put him up on the long splint, afterwards on a MacIntyre, and finally in plaster-of-Paris bandage. At first all seemed to progress favourably, but at the end of seven or eight weeks he found the fracture still ununited, and requested a consultation upon the patient's case. As I had attended this gentleman before, I was summoned to Wigan, and after carefully examining all the details we made out that Mr. W.'s ununited fracture was mainly to be attributed to a hacking throat-cough (caused by an elongated uvula), which constantly shook his frame and jerked the fragments, more especially the upper. At the same time his bodily condition was soft and flabby from long confinement to bed, so much so that we considered it unadvisable to subject him to any operative procedure just then beyond snipping the elongated uvula and painting the throat with perchloride of iron, which very much checked the cough. As for the limb, a large piece of Cocking's poro-plastic felt was moulded into an admirable splint, quite enveloping the thigh, and when tightly strapped enabling him to get about on crutches, and even to bear a little pressure on the foot. After a couple of weeks' hobbling about in this way his health much improved, and he gained sufficient confidence and strength to come down to Liverpool and Bootle, just ten weeks after the accident. The case being now turned over to my care, I had him etherised, and proceeded to break up the false union by forcibly twisting and grating of the fractured surfaces against one another. After some weeks I found the result to be simply *nil*.

A consultation was now held with Mr. Reginald Harrison and Mr. Puzey, the latter of whom attended on behalf of the Railway Company, and we agreed to perform subcutaneous scarification of the ends of the bone, and to bend the knee forcibly, as it was getting very stiff; indeed, then and afterwards, we found reason to believe that the lower fragment was probably split longitudinally down to or near the articulation, but of this we could not be *certain. The limb* was then fixed in an improved apparatus of the MacIntyre

kind, and left at rest. Again there was no local action set up except some pains in the knee-joint, and at the end of a further five weeks from the time of scarifying the pieces were as obstinately loose as ever. Finding now that something further must be done, and that the most likely would be Dieffenbach's operation, I thought a good deal as to how it might be best performed so as to leave the fracture still in its "simple" state, and finally came to the conclusion that the pegging might be done subcutaneously, thus rendering this severe operation of the third class into the milder one of the first class. The tools required are an Archimedian drill-stock, a steel drill four or five inches long, and a few ivory stilettes of the same length and diameter (or slightly tapering) as the drill. The drill and stilettes are similarly graduated in half inches, and the ivories are, moreover, grooved like a director in order to slide along the drill. The *modus operandi* consists in entering the drill through a puncture made by a tenotome down to the bone; the depth of the soft parts is now read off by means of the graduations; then, if it be desired to bore into the bone to the depth of an inch, the drilling is proceeded with until the steel has penetrated an inch further than the original reading. The ivory stilette is now filed *half way through* an inch from the point, and after being soaked in carbolic oil is guided by its groove down alongside the drill to the brink of the perforation in the bone, from out of which the steel is next lifted, the ivory slipped into its place, hammered, and by a smart lateral movement broken off at the filed notch. The operation is completed by withdrawing the remainder of the stilette and sealing the puncture with a bit of lint and plaster. By carefully following the foregoing details it will be found that an inch peg is accurately placed in an inch hole, consequently there is no portion of it projecting into the flesh, and of this we may be certain by seeing before it is broken off that the reading on the ivory at the surface of the skin tallies with the previous reading on the drill; both being graduated alike. A further object is secured by the peg being grooved; a channel is thereby provided for the escape of fluids in the event of osteo-myelitis being set up, thereby avoiding the danger and suffering caused by the damming up in the bone of inflammatory fluids, as would necessarily be the case were the peg solid. If the fracture be oblique or the position of the fragments suitable the drilling may be pushed on into the other portion of the bone, after which a longer peg of ivory can be inserted to hold both pieces together; this, although difficult, is by no means impossible, and would require some slight modifications in the apparatus. The foregoing plan of the operation was submitted to, and kindly approved by, the gentlemen before mentioned; indeed, to Mr. Harrison I am indebted for much aid and valuable suggestions in maturing the details, and we tried it together on the dead subject before venturing it upon the living. All being in readiness, the operation was performed, in the manner just described, on the 21st of last May, when we successfully inserted one peg in the upper and two in the lower fragment. One of the latter pegs was notched to break off one inch from the point as the others had been, but owing to a flaw in the ivory as well as being very deep and tightly gripped by the muscles it broke off about an inch and a half long instead, thus leaving about half an inch projecting above the bone. In spite of this the three punctures healed in twenty-four hours without the development of any pus or constitutional excitement then or afterwards. Thus far we demonstrated the safety and practicability of performing Dieffenbach's operation by the subcutaneous method, and I wish I could add, at least for the patient's sake, that our operation had achieved its intention of exciting local action in the bones, but after giving him plenty of time and rest the fracture is now as loose as ever. The pegs are not felt; in fact, at no time did they give rise to so much local action as we could have desired, and I cannot but think that in this case the patient's osseous system must be unusually tolerant of injury. The operation has failed in this case, the only one in which it has yet been tried, and is so far a discouragement to any further trial of it, for after all "nothing succeeds like success;" but it should be remembered that in this case Dieffenbach's own plan would have failed, and that in many after everything *has been tried,* amputation has been found necessary.

One point worthy of notice is that in case of the pegs exciting suppurative

inflammation and the formation of abscess requiring the laying-open of the fracture the patient is in no worse position as to the wound than the original operation requires; but it must be confessed that in these days of antiseptic surgery the exposure of bones and even of joints is not the formidable thing of the past. Respecting the apparent disappearance or absorption of the pegs in the foregoing case—for no trace of even the broken one which projected into the soft parts appears to be left—it is interesting to recall Mr. Savory's experiments on the absorption of dead bone ("Med. Chir. Trans.," vol. xlvii., p. 103). From these it would appear that one essential towards absorption is firm contact, as in a peg tightly driven into a hole, one which is loosely placed not being affected. To sum up, the operation is, as it always has been, scientific from a physiological point of view; the new modification of it must be allowed to be practical from a mechanical as well as a physiological point of view; its utility requires to be further tested, and I trust will be notwithstanding the cloud of failure which overshadows its first trial. It may be expected to succeed in any case in which Dieffenbach's method promises success, and likewise to fail where that operation has hitherto failed.—*Liverpool and Manchester Medical and Surgical Reports*, 1876, *p.* 64.

39—SHORTENING AND DEFORMITY OF THE FEMUR, CONSEQUENT UPON FRACTURE, SUCCESSFULLY TREATED BY RE-FRACTURE.—DR. CRUISE'S SPLINT.

By P. J. Hayes, Esq., Surgeon to the Mater Misericordiæ Hospital, Dublin.

Cases demanding re-fracture of recently united bones are not of frequent occurrence, hence the following report may prove of sufficient interest to merit notice.

J. M., aged twenty-seven, on the 23rd of August, 1874, received a fracture of the right femur by falling from a car. The bone was broken in the upper part of the middle third, and though the fracture was simple, considerable swelling of the thigh took place before the services of a surgeon could be obtained. Then for some days it was found impossible to apply a splint or reduce deformity. Six days after the accident a Liston's thigh splint was employed, but it was necessary to use, in addition, a short anterior splint, in order to overcome the forward tendency of the upper fragment. The patient could not well bear the pressure of an efficient perineal band, and the gentlemen who had charge of the case determined to remove the splints, and replace them by a gypsum bandage. The splints were taken off on the 1st of October, but as there was some delay in obtaining suitable gypsum the patient was left with sandbags at either side of the limb for twenty-four hours. During the night he managed to twist the thigh, and on the following morning his medical attendant was disappointed to find considerable bowing outwards at the seat of fracture. Chloroform was administered, and the limb brought into as good a position as was possible; then the long splint was reapplied, but as a perineal band could not be borne, extension was kept up by means of a weight and pulley. This treatment was maintained during three weeks, and then the gypsum bandage was employed, and kept upon the limb for nearly three weeks longer. On the 11th November, whilst walking with crutches, the patient again received a hurt of the injured limb from a heavy fall, which was caused by one of the crutches becoming fixed between the bars of a cellar grating, and the surgeon who had attended him previously advised that he should be sent to the Mater Misericordiæ Hospital, where he was admitted on the 23rd November, under the care of Mr. Tyrrell, who found considerable bowing of the thigh in a direction forwards and outwards, as well as shortening of the limb by about two and a half inches.

Mr. Tyrrell determined to break through the callus, and use strong traction, but unfortunately, owing to indisposition, he was forced to relinquish for a time hospital attendance, and having described the case to me, he requested that I *should undertake* the necessary treatment. On the 2nd of *December the patient was* brought fully under the influence of ether, and

placed upon a mattress on the floor of the operation theatre. Dr. Cruise's apparatus for making extension in cases of dislocation was then applied to the limb, exactly as though the patient was suffering from a dislocation of the femur upon the dorsum of the ilium, the traction force was worked up to 125 lbs., and, with my knee against the seat of fracture, I was able to bring all my strength and weight to bear upon the convexity of the bowed thigh. After some minutes I found indications of yielding in the mass of callus, and a few more efforts enabled me to break through it completely. The fragments were disengaged, and considerable extension effected by increasing the traction to 132 lbs.

The patient was then removed to his bed, and sandbags placed at either side of the thigh. I thought it well to allow an elapse of twenty-four hours before using any splint, or subjecting the patient to additional disturbance. The man was in good spirits on the ensuing morning; he had slept well, and ws not in pain; therefore I proceeded to apply a splint which Dr. Cruise kindly lent me, and which proved of great value in effecting and maintaining powerful and necessary extension during three and a half weeks after the operation.

It may be as well to describe this splint before proceeding with particulars of the case. The splint consists of a long wooden portion, to extend from the axilla down beyond the foot; projecting from the inner surface of this splint, close to the lower end, is a thick stout block, perforated from above downwards, and giving passage to a screw twelve inches long, the thread of which fits a spiral groove in the aperture of the block; attached to the upper extremity of the long screw is a cross piece, with projecting hooks, constructed to catch the loop of a Pancoast's stirrup; fixed near to the upper end of the long splint is an iron bar, doubly bent at right angles, so as, when applied, to ascend on one side of the patient's thorax or abdomen, cross in front, and descend on the other side; each end of this bar has in it an opening, through which the posterior part of a perineal band can be passed, the other part being tied to the middle portion of the bar which crosses in front of the patient's body. The splint was used in the following manner:—The patient's leg, from the knee down, was shaved and well washed with vinegar and water, then six strips of soap plaster were caused to adhere one over another; thus united they formed an adhesive strap, about two inches wide, and sufficiently long to extend from the inner side of the knee down the leg, form a good loop below the heel and arch of the foot, and then reach up the leg to the outer side of the knee. Some cotton wadding having been applied over and behind the malleoli, the strap was secured by the exposed surface of soap plaster to the sides of the leg, and a piece of wood three inches and a half long was placed transversely in the loop below the foot; strips of soap plaster were crossed round the leg, so as to afford additional security against the risk of the stirrup slipping from its position under the strain of traction.

Two perineal bands, right and left, were prepared with the view of relaxing one and tightening the other whenever the skin might be likely to suffer from prolonged pressure. The splint was padded, then placed along the outside of the fractured limb, connected below to the stirrup, and above with the perineal band on the right side. Steady working of the screw effected force for extension and counter-extension, and the amount of force employed was regulated by the feelings of the patient, who, being a very sensible, intelligent man, did all in his power to second efforts for his improvement.

The progress of the case was very satisfactory, owing to the care which my resident pupils, Messrs. Flanagan and Hartigan, gave to the working of the apparatus. Three and a half weeks after re-fracture the limb was put up in a gypsum bandage, and the patient allowed to go about on crutches. Three weeks later the gypsum was removed, and the patient left hospital on the 24th of January in the present year, with a straight limb, shorter than its fellow by only three-quarters of an inch.

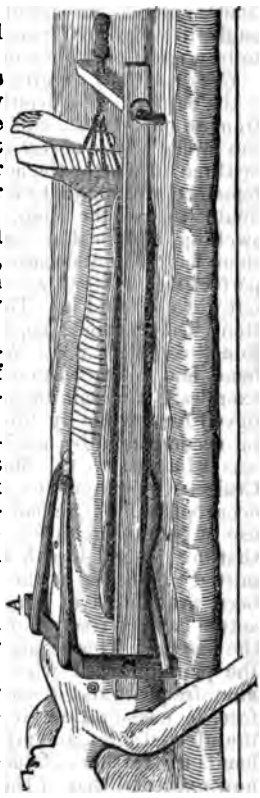
An interesting case of re-fracture of the femur five months after union was *published* by Mr. Butcher in the number of this Journal for November, 1874. *In that instance* very considerable force was required to break the callus. *In the London* Medical Record for March 31st, 1875, Mr. Bellamy refers to a

valuable paper by Professor Nussbaum, of Munich, in which the subject of re-fracture is dealt with, and especial mention made of the treatment to be adopted when the definitive callus has become harder and stronger than normal bone. Thus Langenbeck makes a small wound in the soft parts, then bores a hole through the callus at an angle, and with a fine key-hole saw cuts from this hole right and left until only thin bridges of surface bone remain undivided. After a time healing of the wound in the soft parts takes place, and then moderate force effects simple fracture of the bridges of bone.

Szymanowsky cuts through the soft parts, and saws a wedge-shaped piece out of the callus, three parts of the thickness of which he removes; then, after healing of the soft parts, he easily breaks through the remaining portion of callus.

Nussbaum's proceeding is to chisel through about three-quarters of the thickness of the bone, allow the superficial wound to heal, and afterwards to fracture the undivided portion of bone. He avoids sawdust and *débris*, which might retard healing, by using a fine sharp cabinet-maker's chisel, instead of either saw or drill.

In most cases, however, the surgeon will find he has not only to break through the osseous connexion, but also to overcome the resistance and contraction of fibrous tissue developed around the seat of fracture. In the case I have recorded such tissue was abundant, and, owing to its tough and unyielding nature, I found it impossible to restore normal length of the limb. I received the following communication from Dr. Cruise since the above report was written. The accompanying woodcut will render distinct portions of my description :—



"I send you a woodcut of the splint for fractured femur which I devised some years ago.

"Its advantage amounts to this—that by means of the iron arch A the surgeon has the opportunity of making counter-extension from either side of the perineum at will, and under these circumstances it is impossible, provided ordinary care is taken, for the perineum to become tender or unable to bear the pressure of counter-extension.

"Your recent case of re-fracture of a deformed femur exhibited the necessity of forcible extension, and the case for which I devised this modification of Desault's long splint proves the same fact. My patient was a man named John Reilly, aged forty, who was brought to the Mater Misericordiæ Hospital June 25th, 1863, with an oblique fracture of the right femur, and also a fracture of the corresponding humerus. The latter was easily managed, but the fracture of the femur offered great difficulties. It was remarkably oblique, and the patient being a powerful muscular man, shortening took place and increased, despite my best efforts, because whenever I made extension sufficient to overcome the deformity, the perineum became tender, and after a day or so the strap became unendurable. In this difficulty I thought of the iron arch A, had it made by a blacksmith in my neighbourhood, and I attached it, as the woodcut shows, to the long splint by means of four strong screws.

"From the time I used it I experienced no further trouble. Whenever one side of the perineum became tender I relaxed the strap there, and tightened up that on the opposite side. In this way counter-extension caused no annoyance, the femur united without any appreciable deformity, and the man left the hospital perfectly well on the 29th of September, 1863.

"Of the superiority of this method I think there is no need to speak.

"The idea of making counter-extension from either side of the perineum at will is not original with me. Several American surgeons have done so, and notably the brothers Burge, of Brooklyn, and Lente, of Cold Spring, New York. For Lente's apparatus I refer you to Hamilton on 'Fractures and Dislocations,' page 423.

"The iron arch I have suggested has, nevertheless, the advantages of great simplicity and cheapness, may be made in an hour for any long splint, and makes the counter-extension less oblique, and therefore, less annoying than any apparatus I know of."—*Dublin Journal of Medical Sciences, Oct.* 1875, *p.* 289.

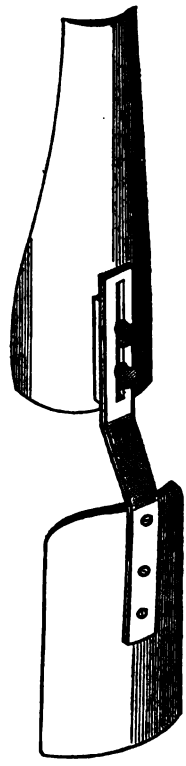
40.—CASES OF EXCISION OF THE KNEE-JOINT.

By P. J. Hayes, Esq., Surgeon to the Mater Misericordiæ Hospital, Dublin.

The great act of surgical conservatism, excision of the knee-joint, is no longer looked upon by those who really know much about it as an operation of doubtful value or extreme risk, but it certainly is a measure to be adopted only after grave consideration and due estimation of the circumstances belonging to each case which may seem to demand a proceeding so serious. In the Irish Hospital Gazette, January 1st, 1874, I published some conclusions arrived at from my previous experience of excision cases. I now report particulars of two successful excisions, as they serve to illustrate points which ought to weigh in favour of excision, instead of amputation, when it comes to be a question which operation is to be selected, or advised by the surgeon.

Case 1.—C. H., a girl, aged eighteen years, gave the following history:—she enjoyed good health until about eight years ago, when she was thrown from an outside car, and fell upon the left knee. The pain at the time of the injury was so severe as to cause fainting and sickness of stomach. Two or three days after the accident she was able to go about, though the joint remained swollen and rather painful, but at the end of a month she became unable to use the limb, in consequence of extreme tenderness, increased swelling, and weakness of the knee. A doctor was then consulted, who said there had been dislocation of the joint; he extended the leg, and advised perfect rest. About a week afterwards she gave the knee a twist, or jerk, but did not mind it. The doctor, however, appeared to think the "dislocation" had recurred; he, however, used external application of iodine, and enjoined complete rest. After a time the patient could walk, but she was lame, and felt a constant dull pain in the knee. This was rendered worse by exercise. The pain became very severe some two years since, but was relieved for a while by blistering, &c. Soon, however, painful startings set in, accompanied by hectic fever, and in July, 1874, she came to Dublin, and was admitted to the Mater Misericordiæ Hospital, under the care of Dr. Cruise. In spite of the most judicious treatment little change for the better occurred, and as she had a sharp attack of erysipelas, consequent upon the use of counter-irritation, she was advised to return to the country, in order that her general health might undergo improvement. She was again admitted to hospital at the close of September, and as other treatment had not been productive of benefit, on the 22nd of October Dr. Cruise applied the actual cautery freely to the skin at either side of, as also above and below, the patella. This seemed to produce good effect for a time, but in December the pain returned with renewed violence, the nocturnal startings became more frequent and distressing, and urgent hectic symptoms appeared; therefore, in consultation, it was considered advisable to recommend excision of the affected joint, and my colleague complimented me by kindly placing in my hands the further conduct of the case. The circumference of the left knee now exceeded that of the right by more than an inch and a half; the swelling was almost uniform, and gave the joint an oval appearance; the patella was *movable*; pressure applied over the tuberosities of the tibia, or condyles of *the femur,* caused considerable pain, and sleep could only be produced by

hypodermic injections of morphia. On the 24th of January, in the present year, I excised the affected joint, ether was the anæsthetic used, and hemorrhage prevented by Esmarch's method. After the operation the raw surface was well sponged with a solution of chloride of zinc (gr. 20 ad. ℥ i.), and the wound closed, save at either angle or corner, by sutures of carbolised catgut. The limb was then put up in the following manner:—Two flannel bandages, one over the other, were evenly applied from the toes up to the level of the anterior tibial tuberosity; the thigh was bandaged also with flannel from the groin down to within about two inches of the lower end of the femur A splint, specially designed by myself, consisting of two concave pieces of wood—one to receive and fit the posterior surface of the leg, from the upper part of the calf to within two and a half inches of the ankle; and the second, to receive the posterior surface of nearly the lower two-thirds of the thigh—the two portions of wood being connected behind the popliteal region by a strong flat piece of steel, with an oblique step in it, so as to keep the leg portion of the splint one inch in advance of the thick portion. Thumb-screws and an oblong slat in this steel strap enable the surgeon to increase or diminish the space between the wooden portions of the splint according to requirements. The leg and thigh pieces having been suitably padded, the limb was laid upon them, and the interval between them regulated to about three inches. A small splint of poro-plastic substance was next padded, and laid over the anterior surface of the thigh, and then a gypsum bandage carried from the toes to the upper edge of the leg bandage (flannel), brought behind the steel band and popliteal space, and carried on round the thigh to the highest level of the splint. This was repeated until a strong casing of gypsum rendered the position of the leg and thigh perfectly secure. Cotton wadding, saturated with melted paraffin, was inserted into the space between the skin of the popliteal region and the steel portion of the splint; also every chink in the gypsum bandage near the wound was painted over with paraffin, whilst the skin in the neighbourhood of the wound remained quite uncovered, and free for the application of dressings, &c. A piece of oiled lint was laid lightly across the wound, and the patient removed to bed. The soft tissues united by adhesion, not a drop of pus ever formed, and on the 14th of February the patient was able to be dressed and carried from her bed to a sofa which was on one of the corridors. By March 18th the patient was able to walk with crutches, as the splint was removed, and replaced by a simple gypsum bandage. There was excellent union. Within the next fortnight she could walk without any assistance from crutch or stick, and left the hospital on the 1st of May with a perfectly straight strong limb, an inch and three-quarters shorter than its fellow.



As regards pulse and temperature, the highest reading of each was on the third day after operation, when the former was 120 in the minute, and the latter reached 101° F. On the tenth day both were down to the normal standard.

The total amount of bone removed was an inch and a half, measured from above downwards. The disease had completely destroyed the synovial membrane, and there was ulceration of the cartilage, both upon the outer condyle of the femur and corresponding facet upon the patella. The cartilage for a considerable area around the ulcerated points was of a rose-red hue, owing to sub-cartilaginous osteitis.

Case 2.—M. C., a girl between seventeen and eighteen years of age, was

admitted to the Mater Misericordiæ Hospital, under the care of Mr. Tyrrell, on the 2nd November, 1874.

History.—Nearly five years back, when at school, she fell from a high table, and her left knee struck upon a hot-water pipe. There was no wound, but she fainted from excessive pain. After the accident she remained in bed for some days, as the joint became very painful and swollen, but at the end of a week she could walk a little, and seven weeks later she returned to the day-school. At this time when the knee was at rest the girl was free from pain. It remained swollen, however, and after much walking the pain returned, so almost every night she felt it stiff and tender. Matters gradually changed for the worse, and after the lapse of two years the patient could not walk, as the least motion produced severe articular pain, and at the same time most distressing nocturnal startings of the limb set in. A medical man was at length consulted. He strapped the affected joint, and applied a suitable splint; of course enjoining strict repose. Under this treatment great relief from pain was experienced, but in other respects the condition of the joint semed not to undergo any change. After a time the pain and startings returned, consequently the girl was brought to Dublin.

It is unnecessary to state the constitutional and local treatment employed by Mr. Tyrrell. The knee was in such a state that all his efforts were directed to allay existing inflammation, and keep the limb in proper position until ankylosis should take place. By the end of December the girl's sufferings were severe indeed. Splints and all extending media had to be removed, as she could only tolerate the semi-flexed position for the knee. There was now a tendency towards backward dislocation of the tibia, and it became manifest that excision of the knee was the proceeding most likely to save the patient's health and limb. Mr. Tyrrell being unable to attend at the time, I undertook charge of the case, and on the 27th of January I performed the operation, removing in all one inch and five lines of bone (measured from above downwards). No hemorrhage occurred, owing to the employment of Esmarch's bandage, after the removal of which three small vessels required to be twisted. The wound was sponged out with chloride of zinc solution, and then the edges brought together by means of catgut sutures. The limb was put up in the manner already described (see preceding case), and nothing could be more satisfactory than the position and security of the bones. Five days after the operation erysipelas attacked the skin about the wound, and necessitated division of the sutures; but, save that all chance of union by adhesion was lost, the effect was not unfortunate, for the inflammation rapidly subsided, and soon granulations filled up the interval between the flaps, suppuration being extremely slight and of very short duration. The temperature reached 102° F. at the onset of the erysipelas, and during the first eight days the pulse ranged from 100 to 130 in the minute. After that temperature and pulse fell to the normal condition. The girl was up a month after the operation, and as the bandage did not now tightly embrace leg and thigh, she could rotate the entire limb within its casing. On the 18th March the splint was removed, and a strong carefully applied gypsum bandage substituted for it, the patient being allowed to go about on crutches. Union soon became very strong, all swelling subsided, and the shortening was only an inch and one third. The result is quite as perfect as in the case of C. H. Permission for her discharge from hospital was given May 1st, but she was kept on longer, in order that photographs of the limb might be taken. The joint, when examined, showed complete destruction of encrusting cartilage, erosion of part of the head of the tibia, and uniform pulpy degeneration of the synovial membranes.

The points to which I would call attention in the foregoing cases, as indicating the propriety of excision, are—1st. The occurrence of progressive articular disease after injury, and not because of constitutional fault ; and 2nd. The comparatively slow advance of the disease, and total absence of suppuration.

As regards the operation, my usual practice is to moderately flex the leg *upon the thigh,* and carry an incision across the ligamentum patellæ, from

the posterior edge of one femoral condyle to a corresponding point on the other (of course, when the limb is extended this incision will form a curve convex downwards). I remove the patella, and saw off no more of femur or tibia than is absolutely necessary, but I pare away every trace of articular cartilage, and remove as completely as possible diseased synovial membrane and crude formations. It is confessedly a difficult matter to overcome the tendency which the lower end of the femur has to project on a plane in front of the greater part of the upper end of the tibia; an outward bowing of the limb also requires to be guarded against. By means of the splint I have described it is alike easy to arrange and retain the bones in perfect position, whilst in other respects all the conditions favourable to early union of the tissues are secured, with confort to the patient, and with the least possible amount of trouble to the surgeon.—*Dublin Journal of Med. Science, Oct.* 1875, *p.* 294.

41.—THE CARBOLISED CATGUT LIGATURE.

By the Editor of the Medical Times and Gazette.

In considering the use of the catgut ligature for tying arteries in their continuity, the question presents itself—Is carbolic acid a necessary agent in the preparation of the catgut? In order to answer this question, we may briefly consider the mode of preparing this so-called *catgut*. The material is really a part of the peritoneum of the sheep, with some fibres of unstriped muscle. This, having been properly cut into lengths and sizes for ligatures might be simply dried and used, or used fresh, but in either of these conditions it is slippery, hard to tie, and when tied apt to stretch, and the knot to slip. Mr. Lister, anxious to procure a ligature which should melt away and be absorbed without acting as a foreign body in the wound, and looking to the somewhat unsatisfactory experiences of Astley Cooper and others, found that by a special preparation this catgut was so altered as to become a firm and useful ligature. If it is suspended in an emulsion of oil and water, during the first few days it becomes dull and opaque, but then a remarkable change occurs: it becomes clear, bright, and hard, and capable of being tied without stretching and slipping. In order to attain this changed condition it is necessary to keep it suspended in the emulsion for about two months, the bottom of the vessel being so arranged that the water, as it separates from the oil, falls down clear of the suspended catgut. It will be ready in two months, but it goes on improving if kept in the emulsion for a much longer period. In order to make a very fine emulsion, the water was mixed with something which the oil would take from it—say spirits of wine —and the water was thus left suspended amongst the oil in very minute drops. Mr. Lister wished to have an antiseptic ligature, and he found that carbolic acid had the requisite properties for forming along with water and oil the required fine emulsion. Hence the *carbolised* catgut ligature.

This answers our question; but it seems probable that if nothing to prevent decomposition was mixed with the emulsion, the animal tissue kept in it for a considerable length of time would be apt to become putrid, and if it did not at the same time lose its special properties, still it would, from its putridity, be very unfit for surgical purposes.

The next question—Is the catgut, carbolised or not, a safe ligature for application to arteries in their continuity?—divides itself into several heads, which we may endeavour to answer from the experiences related during the discussion at the Clinical Society.

If properly prepared, the general experience seems to point to the fact that it is safe, provided the artery be in a fit state for any surgical interference. But an element of uncertainty arises, as some surgeons in tying it divide the internal coat of the artery, while the majority find that they do not. We believe that if sufficient force be used to divide the internal coat, with the additional bruising to the outer coats that this implies, the catgut

will be found inferior to silk, because from its liability to softening and absorption it does not maintain a firm hold on the artery nearly so long as silk, and consequently does not give Nature so long a time to complete her safeguards against secondary hemorrhage.

On the other hand, it seems that the ligature may be so used as to cause ulceration externally, and yet relax so soon as to leave the artery pervious—a very serious state of things.

The remedy to such misfortunes appears to us, however, to lie in a little more experience as to the proper amount of force to employ in tying it, so as effectually to occlude the artery and allow the formation of clot without dividing the internal coat on the one hand, or causing ulceration or sloughing of the external coat on the other.

So far we have kept altogether out of sight the question of its use in aseptic surgery, for which it was introduced in its present form by Mr. Lister.

In his hands, and in those of other surgeons who thoroughly carry out his method, it has been found most trustworthy both for ligature of arteries in their continuity, and also for the ordinary tying of divided arteries; the number of cases in which secondary hemorrhage has occurred being so very small that, looking to the varying nature of the cases, it may fairly be pronounced perfectly successful. Nor must we forget that Mr. Lister only advocates its use in aseptic cases, and that some, at any rate, of the cases we have just alluded to, in which secondary hemorrhage has occurred, have been septic ones from some failure in the details of his method.

In speaking of the preparation of the catgut, we have alluded to the probability that it would become putrid if no antiseptic agent were used; and now we come to the question—Do fluids in a putrid state act in a different manner on the prepared gut to the natural secretions of a wound in an aseptic state? We are inclined to think that if pieces of the same catgut were placed in the secretions of a wound which was distinctly septic, and in those of a wound which was as distinctly aseptic, a marked difference would be found in the state of the material when withdrawn after a few days.

Evidence on this point would not be difficult to obtain, and would have a most important influence on the settlement of this question. Certainly clinical experience points to some such theory to account for the uncertainty in the results obtained by those who merely use the ligature, as compared with the certainty of results obtained by those who use it along with Lister's method.—*Med. Times and Gazette, Nov.* 27, 1875, *p.* 600.

42.—ON THE EMPLOYMENT OF CARBOLISED CATGUT AS A LIGATURE IN AMPUTATIONS AND OTHER MAJOR AMPUTATIONS.

By Dr. A. W. NANKIVELL, Resident Surgeon to St. Bartholomew's Hospital, Chatham.

[Mr. Nankivell has extensively tried carbolised catgut as a ligature in all kinds of operations. Its use was suggested to him by the occurrence of a fatal case of secondary hemorrhage from accidental traction on a hempen ligature.]

The carbolised gut that we have been in the habit of using in this hospital is to be obtained of Messrs. Macfarlan and Co., Barge-yard, Bucklersbury. There are five sizes, from No. 0, which is the thinnest, to No. 4, the thickest. I have employed only two sizes—viz., Nos. 3 and 4, the latter number being quite strong enough for the deligation of any large artery, such as the femoral or brachial, in continuity or on the surface of a stump. No. 3 is of the proper dimensions for the radial, ulnar, and similar vessels. The thinner gut may be used for the arteries in amputations of the fingers and toes, but too many sizes lead to confusion, and I have therefore been content to employ Nos. 3 and 4.

The prepared catgut is sold in hanks steeped in the carbolised oil. It

uld always be kept in the liquid in stoppered bottles, and only taken out
m required, for if this be not done, it is apt to become rough and brittle.
en about to be used—as, for instance, in an amputation of the thigh—an
stant should cut a piece of about four inches in length for the ligature of
main vessel from No. 4. The remaining arteries should be tied with No. 3.
ıd that about eight inches of the gut is enough to secure four vessels.
catgut should not be too old, for I have observed that some that I kept
tock for about two years became far more brittle than when more recently
ɔared. In tying vessels in an open wound I am very particular in sep-
ıng the artery from its sheath and accompanying veins before proceeding
ıpply the ligature, and care should be taken to avoid all jerking in tight-
ıg the catgut. When the material is sound, it will bear steady pressure
hout breaking. It is impossible to give any directions as to the amount
orce to be used in tying an artery; each surgeon must judge for himself
acquire it by habit. I rarely now, if ever, break a sound piece of catgut
ın applying it to a vessel. If a small artery cannot be separated from the
ounding tissues, it is sometimes necessary to use a piece of No. 4 to tie
vessel and neighbouring structures with sufficient force. The ligatures
to have both ends cut off quite close to the artery. I may, perhaps, men-
that prepared catgut is not suitable, in my experience, for sutures in
or operations, especially if there be much tension on the parts; it melts
ıy before firm union of the skin has taken place. I am informed, howev-
that it is useful as a suture in wounds and operations about the eyelids.
'he following is a list of the operations in which the vessels have been
ıred with the carbolised catgut:—

Amputation of thigh	22
" " leg	10
" " foot	6
" " arm	5
" " hand	2
" " breast	10
Excision of hip	2
" elbow	2
Castration	3
Ligature of radial artery	1
" ulnar "	1

a the above table I have excluded lithotomy, herniotomy and the five in-
ıces of ligature of the femoral artery which have already appeared in the
ıcet, as also all minor surgery. These operations have been performed on
h sexes,—on children, adults, and old people; the oldest patient being
ənty-six years of age, with calcareous degeneration of the arteries and
ıghing of the flaps.
ome of the cases did remarkably well, but we have had our share of ery-
ılas, septicæmia, and sloughing in amputations, yet notwithstanding the
avourable state of some of the operations the catgut held firm in all cases
ə one, and we have never had but one instance of secondary hemorrhage in
hospital since we employed this ligature. It is with especial reference
his point that I have written this paper, as I wish to show what our ex-
ience of the use of the carbolized catgut has been in preventing the occur-
ɔe of secondary hemorrhage. The only case in which it did occur was in
ımputation of the foot for incurable ulceration, the result of frost-bite.
norrhage took place from a portion of the diseased tissue, which of ne-
ıity was left behind after the operation. It was speedily arrested by the
lication of a compress, and the man made a good recovery. It has ap-
red to me that in intractable ulceration resulting from burns and frost-
there is a tendency to secondary hemorrhage, whatever ligature be em-
ɣed. My confidence in the catgut is at present unshaken, and I hope that
er surgeons will give it a full trial in open wounds and arteries in their con-
ıity and publish the results of their experience.
n conclusion, I will venture to claim the following advantages for the
ɣut—(1) Immediate closure of the deeper parts of a wound; (2) absence
ınuous tracts; (3) diminution of subsequent bleeding, or rather its en-

tire absence in consequence of the free use of ligatures to bleeding points during the operation; (4) absence of danger from accidental traction on a ligature; (5) above all, the almost entire avoidance of risk from secondary hemorrhage as illustrated by the results of the cases given above.—*Lancet, Feb.* 19, 1876, *p.* 278.

43.—ON AQUAPUNCTURE.

By R. Clement Lucas, Esq., Assistant-Surgeon to Guy's Hospital.

In a paper read before the Scientific Congress at Nantes, in August last, Dr. Leopold Lafitte drew attention to the value of the subcutaneous injection of pure water for the relief of pain. He states that he was induced to try this simple remedy from having observed, when in Paris in 1872, the good effects produced by it in a case of acute rheumatism under the care of M. Dieulafoy. In the opinion of the author of the paper it is an expedient of great value, and he mentions many cases in which he had adopted it with marked success; one especially, a case of acute lumbago, was immediately relieved by the hypodermic injection of two grammes of pure water. Dr. Lafitte refers to an article in the "Nouveau Dictionnaire de Médecine et de Chirurgie Pratiques," entitled Douleur, by M. Georges Dieulafoy, as containing the only written account of this mode of treatment. In this essay, published in 1869, Dr. Dieulafoy concedes the credit of originating the treatment to M. Potain, and speaks enthusiastically of its efficacy. Indeed, after dismissing all other methods for the relief of pain in a few lines, he devotes a whole page to the discussion of its merits. "D'après les expériences très nombreuses, que nous avons recueillies," he says, "voici ce qu'on peut avancer. Quand un individu est atteint d'une douleur, quelque soit son siège et quelle soit sa nature, on peut sans inconvenient combattre la douleur par les injections d'eau, et dans un grand majorité des casle résultat est immediat."

Subsequent to the publication of Dr. Lafitte's paper, Dr. Lélut has given his experience of the same treatment in a letter to L'Union Medicale of October 5th, 1875. His short communication is rendered interesting by an account of the incident which led him unwittingly to employ so simple an expedient. His servant had by accident overturned a bottle containing morphia in solution, which had been left upon his desk, and, wishing to conceal her misfortune, refilled the bottle with water. The following day Dr. Lélut employed the liquid from the bottle for a subcutaneous injection in a patient suffering from sciatica, in whose case he had previously injected morphia. The result was that the patient was relieved, and delighted to find the pain removed without the nausea and sickness that had been excited on former occasions. Astonished at the different effect produced by this injection, Dr. Lelut was led to examine the contents of the bottle, and was surprised to find that it contained only pure water. He repeated the experiment upon other patients, and found that it invariably gave them relief without inducing the unpleasant nausea caused by morphia.

Dr. de Labordette and others have also recorded their experience of aquapuncture in the same journal. A notice of Dr. Lelut's communication appeared in the British Medical Journal of November 27th, 1875; and was followed in the succeeding number by letters from Drs. Burney Yeo and Griffith claiming priority in the hypodermic use of water for the relief of pain. Both these gentlemen mention cases in which they resorted to this expedient with success in 1868. It is probable that this simple experiment has occurred to the minds of not a few. I can, for my own part, testify to its having been a common practice among the dressers at Guy's Hospital in 1867, who, in cases of supposed malingering or imaginary pain, were in the habit of substituting water for morphia. The relief that not unfrequently followed this practice used to be regarded by them as proof of the imaginary nature of the complaint—a deduction which the systematic experiments *of MM. Potain* and Dieulafoy would seem to prove incorrect.

In the following case of sciatica the subcutaneous injection of water was employed at my suggestion, and seemed to bring about a very rapid cure. The case is reported by Mr. Grimwood, and was under the care of Dr. Pye-Smith, to whom I am indebted for permission to publish it.

W. M., aged fifty, a labourer, was admitted into Stephen ward, Guy's Hospital, on January 6th, 1876. He was born of a healthy family, and has generally enjoyed good health, but at the age of sixteen he suffered from an attack of rheumatic fever. His father died of dropsy. He is a married man, and has four sisters living and healthy.

About twelve months ago, when working at the butts at Woolwich Arsenal, he one day got wet through. On the following day he went to work as usual, and worked until dinner-time, but on attempting to rise after dinner he experienced a severe pain in the loins, which compelled him to go home to bed. He was attended by a medical man, and recovered after a time sufficiently to resume work of a lighter kind; but he did not lose entirely the pain in his left loin. He noticed that whenever he strained his left foot he was seized with cramp and suffered from a sensation as of pins and needles running up his leg. For about a month he has suffered from severe pain in his left hip, which is gnawing and continuous, but comes on sharper at some times than at others; it never entirely ceases. He also suffers at intervals from pain in the knee and on the dorsum of the left foot.

He is a tall, strongly-built man, with a ruddy countenance, but bears a pinched and anxious expression. He lies upon his back with his left leg drawn up and adducted, a position which gives him the greatest ease from pain. The percussion-note over the chest is good and the breath-sounds are normal; the heart-sounds are indistinct but clear; liver and spleen normal; tongue clean; appetite good; bowels regular. His urine yields a slight deposit, but contains no albumen or sugar; sp. gr. 1030. Temperature normal. He was ordered a mixture containing magnesia and sulphate of magnesia, to be taken twice a day, and a Dover's pill every night.

Jan. 11th. The patient has not experienced any relief from the pain. A blister four inches square was applied over the sacro-iliac articulation, where the chief pain seems to be situated, and the following mixture was ordered to be taken three times a day:—Iodide of potassium, ten grains; bicarbonate of potash, ten grains; infusion of calumba, one ounce.

13th. Patient has less pain in the hip, but has suffered pain in the leg and ankle this morning.

16th. The pain in the leg and ankle is no better. A slight rash has come out upon his face, probably caused by the iodide of potassium. He feels well in health; temperature normal. Ordered a subcutaneous injection of a quarter of a grain of morphia every night.

17th. The patient is better. He says he has no pain in the hip or thigh, and has pain in the foot and ankle, which he can move about a little.

18th. A blister four inches in length by one in breadth was ordered to be applied along the course of the great sciatic nerve.

21st. Patient is better. The pain is confined to the foot and half-way up the leg; it affects the big toe and the two next. He has had no coldness of the skin since the use of morphia injections, and says he can move the leg more freely.

24th. The pain is less in the foot, and the patient can bend the toes, which he was unable to do before. He complains of pain of a darting character, which shoots from the heel into the groin. He has a slight headache to-day.

25th. The pain in the hip and foot having returned, Dr. Pye-Smith desired that the patient should be examined by Mr. Lucas, who gave the following report: "The left leg is semiflexed and adducted. The muscles of the left leg and thigh, and those of the gluteal region on that side, are considerably wasted. The left leg below the knee measured three-quarters of an inch less than the right on the same level. No pain is excited by percussing the heel or great trochanter. The movements of the hip-joint are quite free, pain only being caused by extreme flexion; and this is probably due to stretching of the great sciatic nerve, as he complains at the same time of a

sensation of pins and needles down the back of his leg and foot. There is no thickening about the hip. There are some enlarged glands in the groin, produced, I have no doubt, by the irritation of the blisters. I believe the symptoms have their origin in the great sciatic nerve, and should recommend the subcutaneous injection of half a drachm of water three times a day."

The injections, which were of cold water and introduced into the arm, were given as follows: Jan. 25th, one at 9 p.m.; 26th, one at 4 p.m, and one at 9 p.m.; 27th, one at 10 a.m., a second at 4 p.m., and a third at 9 p.m.; 28th, one at 10 a.m.

He experienced relief from the first injections, and on the 28th was sitting up and quite free from pain. He says the injections first caused pain at the site of introduction, and were followed after a time by a warm perspiration and relief of the symptoms in the hip and leg. The injections were omitted on this day, and the following mixture was ordered to be taken three times a day: ten minims of dilute sulphuric acid, one drachm of compound tincture of cinchona, and an ounce of decoction of cinchona.

31st. The patient has had no return of the pain. The glands in the groin are still slightly swollen. He left the hospital to-day, feeling quite well.

Remarks.—There can be no doubt that this man's sufferings were perfectly genuine. There was wasting of the muscles of the gluteal region, as well as of the leg and thigh of the affected side, and the leg was semiflexed and adducted. Moreover, the percussion and manipulation, to which he was subjected, evoked from him none of the exaggerated complaints that would most certainly have emanated from a malingerer; and, further, he throughout expressed himself as being desirous of returning to his employment.

It will be seen from the report that he had been severely blistered, had taken iodide of potassium regularly, and received an injection of morphia every night for some time; and under this combined treatment he had improved. But a return or increase in the pain induced Dr. Pye-Smith to ask me to examine the patient for more substantial disease. The effect of the injection of water was, according to the patient, to cause severe pain at the seat of introduction, followed by perspiration and relief of pain in the affected limb. It may be, as Dr. Pye-Smith suggested, that the cure had already well-nigh been effected, and that the injections simply distracted the patient's attention from the part. I intended that the injections should be inserted over the seat of pain, but it is perhaps as well that the misunderstanding which led to the introduction of the injections into the arm should have taken place, although it renders more difficult any attempt to explain the manner in which relief was brought about. Dr. Lafitte, injecting always over the painful spot, accounts for the relief afforded by supposing that the fluid introduced compresses the peripheral extremities of the painful nerves, and so brings about their temporary paralysis. It is evident that no such explanation is applicable to the foregoing case, as the injections were introduced at a distance from the seat of pain. There remain but two other ways of explaining the effects produced: either the local irritation causes such central excitement as to dull the perception of the sensorium to lesser pains, or the effect is throughout a mental one, which may be compared to the relief sufferers from toothache so often obtain on approaching the house of a dentist. The explanation of the result, however, is of less consequence than the result itself, and may be allowed to wait until a certain consistency of effect has been established as occurring from the subcutaneous use of water. It is scarcely to be expected that all pains may be equally relieved by this one method, as Dr. Dieulafoy asserts. Numerous failures must surely occur; and, if I might forecast the verdict of the future, I would anticipate that nerve-pains—neuralgias, sciatica, and the like—are more likely to be relieved by the remedy in question than the sufferings incident to chronic progressive diseases, such as cancer. As to the manner of injection and quantity of fluid to be introduced, Dr. Dieulafoy recommends that the seat of greatest pain should be searched for, and eight or ten drops of water be there injected. This, he says, may be repeated ten, twelve, or fifteen times at one sitting, if *necessary*. Dr. Lafitte, in a letter to l'Union Médicale of Oct. 5th, 1875, *says that he* injects two grammes and then waits a couple of minutes, and if

the pain be not relieved he then injects two grammes more. Even five or six syringefuls may be sometimes injected. He thinks that less than two grammes or more than ten should never be injected. He further insists strongly on the necessity of injecting over the painful part: "Le seul point important à noter et à retenir c'est de faire l'injection *au point douloureux*. Tout le sécret d'une bonne opération est là." The operation itself is so simple and so entirely free from danger that positive proof or disproof of its efficacy in relieving pain ought soon to be accumulated.

In conclusion, if the foregoing case should lead to an impartial and systematic investigation of the value of aquapuncture, in England, the object of its publication will be accomplished.—*Lancet, March* 4, 1876, *p.* 344.

44.—ON THE ELECTROLYTIC DISPERSION OF TUMOURS.

By Dr. Julius Althaus, Physician to the Hospital for Diseases of the Nervous System.

There are now so many and effective modes of treating the various forms of morbid growths which are met with in practice, that it would hardly be allowable to add another means to those already at the disposal of the surgeon, unless it could be shown that it possessed peculiar advantages of its own over other methods used for the destruction of these growths, or that it was applicable to such forms of tumours as are otherwise unmanageable or rebellious to treatment.

I will, therefore, only say that in electrolysis the constant voltaic current is conveyed to the tumours by means of gold needles, which act either in fixed rows, or singly in any direction that may be required by means of the serres-fines conductor; that either the influence of the negative or of the positive, or of both poles simultaneously, is utilised; and that the effects are not owing to the development of heat, and have consequently nothing to do with the galvanic cautery.

In cases where only the negative pole is used, as, for instance, in bronchocele, the operation is not painful if properly performed; but, where both poles have to be inserted into the tissues, as in nævus, subaceous tumours, &c., a good deal of pain is generally experienced by the patient, and chloroform or some other anæsthetic may, therefore, be used under such circumstances if thought advisable.

1. *Nævus.*—One of the commonest tumours met with in practice is nævus of the face or scalp. Although this is not, as a rule, dangerous to life, it is nevertheless desirable to have it removed, as it disfigures the person affected with it. Almost every surgeon has a favourite plan of treating nævus, with the results of which he is well satisfied; but I doubt whether any other mode of removing some of these unsightly marks is as good as electrolysis, and those who have once used it will probably always use it again. Over excision, it has the advantage of being entirely bloodless; over the injection of perchloride of iron, that it is not dangerous to life; over cauterisation by nitric acid, that it can be better localised, and acts more thoroughly; over the subcutaneous ligature, that, once the operation has been performed, no further suffering is caused to the child, or trouble to the medical attendant; and over the galvanic cautery, that it does not leave a scar. It is rapidly successful in the flat round tumours of the size of a shiling, which are only slightly raised above the skin, but acts less quickly in extensive "port wine marks." Where nævus assumes the form of large fleshy masses or lumps, the treatment is rather tedious, and, unless the patient perseveres, not so satisfactory in its results. An ordinary round flat nævus yields to one electrolytic application, while in extensive "port wine marks" half a dozen or more applications may be required. The current should be directed to the tumour by means of fixed rows of gold needles, connected with both poles of ten to fifteen cells of Becker-Muirhead's battery. As soon as the connection has been made, a destruction of the texture of the nævus is seen to commence,

the blood-vessels and the skin withering away rapidly under the eyes of the operator. The destruction is more thorough at the positive than at the negative pole, and the worst parts of the nævus should, therefore, always undergo the influence of the former. As a rule, not a drop of blood is lost during the operation; but if, by sudden movements of the child, one of the needles should come out prematurely and a drop of blood should appear, this can be immediately coagulated, and any hemorrhage checked, by applying the positive pole to the puncture. The whole mass of the tumour is then gradually brought under the influence of the current, care being taken not to act too long or too energetically upon any one point, as otherwise a scar might be left. When everything morbid appears to have been destroyed, the action is discontinued, and the surface covered with a piece of goldbeater's skin. There is no pain or discomfort after the operation; no dressing is required, for there is no discharge; the scab remains dry, and falls off in ten or fourteen days, leaving a healthy surface which gradually assumes the appearance of the surrounding skin.

2. *Bronchocele.*—Cystic bronchocele yields to a number of operative procedures, such as the seton, injection of iodine, or perchloride of iron, &c. Amongst these means, electrolysis may claim a foremost place from the comparatively painless nature of the proceeding, the absence of risk to life, and the circumstance that there is, as a rule, no open wound or sore produced which requires dressing. The best mode of proceeding is to insert two or three needles singly into the cyst, and connect them by means of the serres-fines conductor with the negative pole of the battery, while the positive electrode connected with a moistened sponge is placed on the skin in the neighbourhood. The consequence of this is, that the liquid in cyst is decomposed, the chloride of sodium solution being changed into one of caustic soda, whereby the secreting membrane of the cyst is cauterised and prevented from effusing further liquid. From two to six applications appear to be sufficient for a cure.

Solid Bronchocele is much more difficult to deal with, and the ablest surgeons of the present day habitually refuse to interfere in such cases, there being imminent risk to life attached to such operations as were previously practised. These tumours, however, often become dangerous to life by pressure on important neighbouring organs, and electrolysis then steps in as the right thing in the right place. I have of late years combined injections of the tincture or liniment of iodine into the substance of the tumour with the electrolytic applications, as it seemed to me that by such combined treatment time was gained. Iodine, subcutaneously injected, appears to break up the internal structure of the tumour, more especially where this is very old and tough, and aids electrolysis by allowing a freer passage of the current through the mass. In recent tumours, electrolysis alone is sufficient; but most cases which have been under my care have been of many years' standing.

I will now relate the particulars of a case of double solid bronchocele which I have treated in this manner, and which may be considered typical of this class of cases.

Case.—J. L., aged 37, single, a native of Yorkshire, and engaged in a mercantile firm in the city, came under my care in April 1874. He had for the last ten years been subject to a tumour in front of the left side of the neck, involving the thyroid body, which had very gradually increased until it reached an inconvenient size. The patient had on various occasions consulted the heads of the surgical profession in London, with the view of having it removed. This, however, was not considered expedient by the eminent men whose opinions the patient had sought, and nothing had been done except painting the skin over the tumour with iodine, which had no beneficial effect. Things had gone on for a considerable time in this manner, when on April 10th, suddenly a fresh tumour appeared on the right side of the neck, over the collar-bone. This was accompanied by an increase of temperature in the parts, and the swelling showed considerable pulsation. At the *same time*, alarming symptoms of pressure on the pneumo-gastric nerve became *apparent*; viz., loss of voice and of the power of swallowing, a sense of

choking in the throat, and severe pain at the back of the head, on the right side. There was regurgitation of liquids through the nose, and the patient had not slept for four days and nights, but was obliged to sit up in bed propped up by pillows, or to lean forward in a chair.

Under these circumstances, he had again consulted Sir William Fergusson, and entreated him to operate. Sir William, however, declined to do so, and the patient was then sent to me by his usual medical attendant, Dr. Black, of Islington. I first saw him on April 13th, 1874, and found him in the following state. The pulse was 120; respirations, 36; anxious expression of countenance; eyes staring and protruded; excessive action of the left ventricle. He had not been able to eat or sleep for four days, and could only talk in a whisper. In front of the left side of the neck, there was a tumour of the size of a small orange, which was very hard, and showed no signs of fluctuation. It was limited interiorly by the thyroid cartilage and windpipe, which were considerably displaced to the right side; exteriorly, by the strongly pulsating carotid artery; superiorly, by the horizontal branch of the lower jaw; and inferiorly, by the apex of the trigonum supraclaviculare. On the right side, there was a small but strongly pulsating tumour occupying the space of the supraclavicular triangle. It was much softer and less prominent than the one on the left side. The circumference of the neck on the most prominent point of the left side was 16½ inches, and on the right side 15½ inches.

The patient was in such a state of prostration, and so racked with pain and distress, that I thought it best to commence the treatment with an external application of the constant current, for the purpose of soothing and strengthening the central nervous system and diminishing the effects of pressure upon the pneumogastric. He recovered his voice almost immediately; had some sleep the night after, and no more regurgitation of liquids. Next morning, the expression was less anxious; the pulse had gone down to 90 beats; respirations, 28; the voice went away and came again from time to time. On April 15th, he reported that he had had four hours' sleep; eating had become easier; he had drunk off a whole tumblerful of beef-tea without trouble, and the voice was stronger. The tumour on the right side was smaller, and its pulsation much diminished. The headache was still intense, and did not seem to be affected by the external application of the current. On April 19th, I introduced a needle connected with the cathode of fifteen cells of Becker Muirhead's battery into the tumour on the right side, and allowed the current to pass through it for fifteen minutes. On the 21st, the patient reported that he had eaten some fowl and pudding, and that the headache was nearly gone. The old tumour on the left side was now likewise attacked by electrolysis and parenchymatous injections of iodine.

I will not weary your attention by further details about the treatment and progress of this case. Suffice it to say that by the middle of May the tumour on the right side had entirely disappeared, and that the left was then shrinking visibly under the influence of the treatment, which was continued, with some considerable intervals, until the middle of March last. At that time, there was only just a trace left to show that there had been once a tumour; the circumference of the neck was reduced from 16½ inches to 13⅞ inches. The patient has since resumed his work in the city, and was, when I last saw him (July, 1875), in all respects in good health. Sir William Fergusson had an opportunity of examining him again about that time, and expressed to me his gratification at the successful result of my treatment in a case which he had thought beyond surgical interference.

It may be asked whether the result in this case was more owing to electrolysis or to the injections of iodine. Having carefully watched the effects of both, I have come to the conclusion that, of the two agents employed, electrolysis was by far the most effective. Indeed, one of the tumours yielded entirely to this alone in a comparatively short time. The iodine, however, unquestionably aided the action of the voltaic current in the manner described above; and I have since then, in view of this result, treated similar tumours again in a similar manner.—*British Medical Journal*, Nov. 13, 1875, *p.* 606.

ORGANS OF CIRCULATION.

45.—CASE OF AORTIC ANEURISM SUCCESSFULLY TREATED BY THE DISTAL LIGATURE.

By THOMAS ANNANDALE, Esq., Surgeon to the Edinburgh Infirmary, and Lecturer on Clinical Surgery.

R. B., aged 62, was first admitted under my care in August, 1874, on the recommendation of Dr. Wilson, of Motherwell. The patient had suffered from symptoms of thoracic aneurism for about six months; and, as these were steadily increasing in severity, he was advised to come into the infirmary.

On admission, there was a distinct aneurismal tumour, pulsating strongly, and passing up from behind the clavicle and sterno-clavicular articulation into the neck, as far as the cricoid cartilage. The trachea was displaced towards the left side by the tumour, and the inner half of the clavicle and its articulation with the sternum were pushed forward by the portion of the tumour under them. There was a well-marked *bruit* to be heard on all sides of the swelling, and there was dulness on percussion over a considerable area, corresponding to the situation of the thoracic part of the tumour. In addition to these symptoms, the patient had a constant irritating cough, pains shooting up into the head, want of sleep, and he was losing flesh markedly. He was ordered to keep in bed; and iodide of potassium, in twenty-grain doses, was given three times a day. After one month of this treatment, he left the hospital with his symptoms somewhat relieved, and he was advised to continue the iodide of potassium.

On February 8th, 1875, he was again admitted into my wards, as his symptoms had returned and become more troublesome. He had been unable to continue the iodide regularly, owing to the expense of it. An examination of the tumour showed an increase in its cervical portions. It had not only spread higher up, but it had also spread laterally so as to overlap the site of the subclavian artery. The upper portion of the tumour felt softer; and it was this portion which seemed to be increasing most rapidly. After carefully considering the circumstances of the case, and determining that pressure on the right carotid artery, immediately above the cervical portion of the tumour, very much diminished the aneurismal pulsation, it seemed to me a favourable opportunity for practising the distal ligature. The position of the tumour did not permit the subclavian artery to be ligatured; but there was just sufficient room to secure the common carotid above the cervical portion of the aneurism.

The patient having given his consent, I, on the 2nd of March, ligatured the common carotid immediately under the omo-hyoid muscle, which was drawn upwards, so as to reach the vessel. The internal jugular vein was unusually large and dilated; and some care was necessary to avoid injuring it, as it completely overlapped the artery. The operation was performed under the carbolic spray, and the ligature used was prepared catgut. The immediate effect of the ligature was to almost stop the aneurismal pulsation, and to convert the strong pulsation into a kind of quivering motion. Not the slightest local or constitutional disturbance followed the operation; and the wound was healed on the 17th. A week afterwards, the patient was out of bed. The day after the operation, the patient expressed himself as greatly relieved. He no longer himself felt the pulsation in the tumour, and the pains in his head and neck had disappeared. The pulsation in the aneurism was felt to be very feeble, and the tumour itself was decidedly smaller.

The patient left the hospital a few weeks afterwards, his symptoms continuing in the same improved condition, and the tumour gradually becoming firmer to the feel.

From time to time, the patient returned from the country to show himself, and his state on September 27th was as follows: His general health was *good, and he* had no pain or other uneasiness. He could stoop freely with-

out giddiness, and could go up and down stairs easily. The tumour had continued to diminish in size, and its cervical portion was fully half an inch lower in level than before the operation. The whole tumour had become much flatter, and also firmer to the touch. On placing the hand over it, only a very feeble pulsation could be felt, but the pulsation was slightly stronger over the upper part of the cervical portion. A *bruit* conld still be heard on all sides of the tumour, but it was not nearly so loud as formerly.

Remarks.—Although it cannot be said that the aneurism in the case reported was completely cured, there can be no doubt as to the great relief which followed the operation. The case, therefore, appears to me to furnish additional evidence in favour of the distal ligature in suitable examples of otherwise incurable aneurisms, and it also tends to confirm the opinions of Mr. Holmes, and Mr. C. Heath, who have so ably written on the subject.

From my experience in other cases of thoracic and cervical aneurism, and from an observation of cases treated by my friend and colleague Dr. G. Balfour, I can testify to the value of iodide of potassium in relieving the symptoms and promoting coagulation in this disease; but I am inclined to express the opinion that, should a fair trial of this drug fail to give complete relief to the symptoms, the distal ligature of the carotid should be employed, provided the case be a suitable one for the operation. The test of the suitability of the case for operation being the effect which temporary pressure on the distal portion of the carotid has on the aneurismal pulsation. If such pressure diminish the aneurismal pulsation, and should there be sufficient space to ligature the common carotid above the tumour, then I think the case is a proper one for operative interference. I also think with Mr. Holmes that operative interference should, in the first instance, be confined to ligature of the carotid, ligature of the third part of the subclavian being resorted to if advisable at a future stage in the progress of the case.

The case reported further illustrates the value of the antiseptic catgut ligature and other antiseptic precautions, the combined use of which has, in my opinion, removed all the most serious risks in connection with the ligature of arteries.—*British Med. Journal, Oct.* 30, 1875, *p.* 550.

46.—ON A RECENT CASE OF LIGATURE OF THE EXTERNAL ILIAC ARTERY BY AN ANTISEPTIC MATERIAL,

FOR THE CURE OF AN UNUSUAL NUMBER OF ANEURISMS.

By Oliver Pemberton, Esq., Professor of Surgery in Queen's College, Birmingham.

In the number of the Lancet for Feb. 5th a brief note recorded the fact that nine days previously I had secured the external iliac artery in the case of a patient 47 years of age, in whom were present in the same limb three considerable aneurismal tumours—namely, one beneath Poupart's ligament, one at the apex of Scarpa's space, and one in the popliteal region. Beyond this it was noticed that a special animal ligature was employed, and that, in reference to the question of the renewal of the circulation in the limb, the collateral development, before it could succeed, must overcome no less than four absolute barriers established in the main trunk—namely, at the seat of ligature, and at the situations of the three solid aneurisms respectively.

The lapse of three weeks since the performance of the operation enables me to speak with confidence on one or two points just now of great importance, more especially as regards the value of the antiseptic method of ligaturing an artery in its continuity.

The wound for the application of the ligature is soundly healed, having for the first fourteen days been thoroughly antiseptic, and for the subsequent ones being dressed with a resin ointment to remedy some adjacent excoriation. The aneurismal tumours are firm and contracting in dimensions. Gangrene ends by a well-defined line at the middle of the leg, the dead part

being dry, absolutely without putrefaction, under an antiseptic dressing of cotton-wool prepared by saturation in a solution of carbolic acid in ether. The patient is well, and beyond suffering pain near the line of demarcation, is undisturbed by the death of his foot.

And now I come to the centre point of interest in this case, which is, I think, complete, and which circumstance alone is my reason for referring to it at this period, ere, indeed, the general result can be completely appreciated and recorded. That centre point is the having been able to tie a diseased artery so as to escape, by the mode of operation, the risk of secondary hemorrhage—a risk more than ordinarily threatening in the face of the existence of such extensive disease in the same arterial trunk.

I asked myself this question, Will the compressing power of the animal ligature I am about to use last sufficiently long to establish an adequate coagulum? If it will, I shall cure my patient's aneurisms. If not, I dare not tie the artery close to an aneurismal sac with a ligature that has to cut its way through the vessel.

I venture to think that a satisfactory answer is afforded by what has happened in this case to the several misgivings alluded to by Mr. Maunder—amongst others, as to the conduct of such a ligature as the one I employed. It will be for Professor Lister to say of what material the ligature he gave me was made up. Such a ligature as I used I feel assured will hold in any number of cases in which it may be tried; round, smooth, not thick, it was the perfection of a material, as it seemed to me, to make a firm and unyielding knot.

I have but to record, that with it I tied a large and probably diseased artery close to an aneurismal sac; that I tied it so as to be satisfied the outer coat was not severed, whilst I should think the internal ones were; that all suppuration was prevented about the tied artery by antiseptic dressing; that the wound was soundly healed at the end of three weeks, and that pulsation had ceased in the aneurisms from the moment of the operation being accomplished.—*Lancet, Feb.* 26, 1876, *p.* 310.

47.—TORSION OF ARTERIES.

By Dr. Robert M'Donnell, F.R.S.

[It is unquestionably owing to the exertions of Mr. Bryant, of Guy's Hospital, and of Professor Humphrey, of Cambridge, that torsion has now become an established practice. Its latest rival is the use of carbolised catgut ligature for arteries of even the largest size.]

Any one desirous of making himself expert in the art of arresting bleeding by torsion should begin by making a few experimental trials on vessels taken from the subject. One or two simple principles are thus learned. Suppose we take a few inches of the femoral or brachial artery cleanly dissected out from a recently dead subject. The end of the vessel is caught hold of by a pair of forceps (closing with a spring-catch or bolt) broad enough to catch the entire mouth of the vessel. By means of a second pair of forceps, the vessel is seized at right angles. This second pair of forceps consists of two blades; a projecting ridge on one blade fits into an indentation on the other. Seized transversely in this second pair of forceps, the vessel is squeezed tightly, and thus its internal tunics are nipped across, while its outer coat, which is much tougher, is not. The second pair of forceps have now done all that is required of them, and the twisting is accomplished by the first pair, the vessel being overlaid and twisted at the point where the inner tunics have been nipped through. It is curious and indeed interesting to observe what happens as the twisting is continued. The inner tunics actually *peel off* and double up, becoming invaginated in the vessel; the external *tunic twists* into a firm cord with little or no tendency to untwist. The ap-

pearance of this invagination of the inner tunics is well represented by Mr. Bryant in the illustrations accompanying his paper. It was, however, admirably figured long before by P. J. Manec in his works, "De la Ligature des Artères," 1832 (plate xi., figs. 2, 3, 4, and 5). A few trials, however, on the arteries of the dead subject, and a careful inspection of the result, will do more than any illustration to satisfy the surgeon of the security which arises from the peculiar mode in which torsion obstructs the end of an artery. I would venture to assert that no surgeon who will take the trouble of investigating the matter by a few experiments of this kind will long resist the practice. It is obvious that torsion is not to be applied to all kinds of vessels in exactly the same manner. Experience teaches that we must adopt somewhat different expedients in securing by torsion vessels differing in size and position; the greater or less laxity of the tissue which surrounds the vessel, the character of its sheath, &c., all make it necessary to modify somewhat the mode of procedure. The surgeon should have at hand, therefore, several varieties of torsion forceps, since a pair well suited to twist one vessel may not answer so well for another. Perhaps the simplest and most practical mode in which I can hope to convey to those who have not as yet learnt the mode of torsion for themselves some idea of the details of the practice, is by describing as accurately as I can how it may be done on different vessels. *First*, then, vessels met with in amputations of about the size of the radial or ulnar are easily secured. They are best twisted by the aid of toothed forceps. These forceps are, I believe, generally known as "Syme's torsion forceps." The vessel is to be seized right across its open mouth and drawn out a little; it is then caught just beyond the forceps, between the thumb and forefinger of the left hand, so that the nail of the thumb may give it a good pinch, and nip through the internal tunics; then twist and all is secure. The end may in the case of such vessels be twisted off or not, as the operator pleases. If the forceps catch the vessel by the lip only, or at the side, it will of course continue to bleed. In order to be successful the vessel must be caught entirely across the mouth, and the outer tunic must be twisted. *Secondly*, if the vessel be surrounded by a large quantity of lax areolar tissue, as in the scrotum, prepuce, around the eyelids, or in the loose tissue forming the bed from which a fibrous tumour has been removed, the forceps last mentioned do not answer well. The teeth project too much. When twisted they catch in the loose areolar tissue, as a corkscrew would if twisted in tow; this prevents the proper twisting of the vessel itself at one point, viz., where the inner tunics are divided by being nipped. For vessels of this sort such forceps as are here (*forceps exhibited*) are very good. As before, the vessel is to be caught across the mouth, if possible, nipped by the nail of the thumb of the left hand, and twisted so that the external tunic is overlaid at the point where the nip has been made. *Thirdly*. Vessels lying in muscular tissue are sometimes troublesome to secure by twisting. This is not so when, as on the face of a stump, the vessel can be fairly and completely caught by the mouth. Here muscular branches of an artery are as readily secured as other vessels. But suppose, for example, that a breast has been removed, and the great pectoral exposed; a bleeding point on the muscle is seized and twisted; the part seized tears away readily and leaves a little pit bleeding more than before. The vessel has in truth been caught sideways and a piece torn out of it, all the more readily because the muscular tissue in which it is imbedded is friable. The difficulty in these cases arises from the fact that where we have to deal with a longitudinal and not a transverse section of a muscle there is more trouble in making sure that we catch the vessel right across the mouth. If it be scraped with the handle of a scalpel, perhaps, if need be, rather roughly, so as to let the vessel be distinctly seen, and caught, not longitudinally, but transversely across the mouth, the twisting may be performed as readily as on any other vessel. *Fourthly*. Some special difficulty may be experienced in securing by torsion vessels which lie deeply between bones and in the close vicinity of a dense membrane,—as the interosseus arteries in the forearm and leg. In this case the vessel must be detached carefully, either by the handle of the scalpel or by dissection from its surroundings. Obviously

if, in seizing such a vessel, the interosseus membrane is also taken hold of by the forceps, a successful twisting would be impossible. From this membrane the vessel must be entirely separated. *Fifthly.* Such vessels as the brachial, femoral, or popliteal, are in general very readily secured by torsion; in the great majority of instances it is only necessary to attend to the principles already laid down, viz.: 1st, to catch the vessel clean across the mouth; and 2nd, to divide by some means the inner tunics and twist the outer coat at that point. In all cases of amputation for injuries, where the tissue round the vessel is healthy, it is usually quite an easy matter so far to detach from the adjacent parts as to accomplish in a few seconds all that is necessary. If, however, we are amputating in the neighbourhood of diseased structures, sinuses, &c., where the parts are matted together, it is necessary by some touches of the point of a scalpel to free the vessel from the surrounding parts. Even then it cannot be drawn out as in the former case. The parts around are unyielding, and it is by no means easy to get space enough beyond the ends of the first or grasping forceps to apply the second or nipping forceps. Under these circumstances I adopt the following expedient. I place a silk ligature round the vessel immediately beyond the ends of the grasping forceps (which for large vessels are to be made big enough to catch the entire mouth of the artery). This ligature I pull home until it snaps across. To make sure of accomplishing this with some facility I have the silk fixed on wooden cylinders, so that it can without hurting one's fingers be pulled home until it snaps across. It invariably snaps at the knot, and is to be pulled off and cast aside. We thus accomplish, by a snapped ligature, what is done in other cases by the nipping forceps, and then proceed to twist; three or more half-turns are sufficient for the femoral, and I always in this case leave the end still adhering If the wound is washed with chloride of zinc solution or otherwise properly antisepticized with carbolic acid water, &c., these portions do not act as foreign bodies, but are absorbed as Lister's catgut ligature is.

[Dr. M'Donnell then exhibited the brachial artery of a man who had died five days after an amputation of the arm, in which the brachial artery had been twisted. He said the vessel was perfectly secured, and that the extreme end which had not been twisted off showed no disposition to slough. This case was sufficient to prove that the objection raised as to torsion—that the extremity of the vessel was likely to slough and act as a foreign body—was groundless. There was in truth no more likelihood of this occurring after torsion than after the application of an ordinary ligature, as in this case also the extremity of the vessel had the same risk of sloughing.]

Dr. M'Donnell then proceeded:—The mode which I now propose, and which I have over and over again put in practice, of using a silk ligature, not too strong, pulled home until it breaks, for the purpose of dividing the inner tunics of the vessel previous to twisting, is very simple, and, I may add, very effectual. It supplies the place of the nipping forceps or the thumb-nail, and is applicable to vessels of all sizes which are unmanageable in other ways. In fact, no readier way of securing ordinary sized arteries can be suggested than to put on, first, a silk ligature, and then seize the knot in a pair of torsion forceps and twist it off; the vessel is perfectly secured, and there is no foreign body left behind in the wound. Large wounds are often then found healed on the twelfth to the fourteenth day; that is about the time that, in cases where a bundle of ligatures have been left in the wound, these are beginning to separate. Some ingenious instruments have been devised for performing with a single instrument the double manœuvre of nipping the coats and grasping the vessel to twist it. Among these I would mention a kind of forceps invented by Dr. Addinell Hewson, surgeon to the Pennsylvania Hospital in Philadelphia. Dr. Hewson was good enough to present me with a pair of these forceps last year, when I had the pleasure of visiting his city. I have since then had several opportunities of using them, and found them do their work satisfactorily on vessels not surrounded with brawny, tough, infiltrated structure. Where, however, this condition *exists, or, in fact,* wherever there is any difficulty in drawing the vessels out *a little from* the surrounding structures, Dr. Hewson's forceps are open to

the same objection as arises in attempting to use the cross-nipping forceps. There is not space enough to apply them, and to nip properly beyond the ends of the grasping forceps. The advantage of the ligature pulled until it snaps and comes away is simply that we can in this way accomplish all we wish to do as regards dividing the inner coats upon a very limited piece of the artery.

[Dr. M'Donnell also exhibited a pair of forceps devised by himself, and made by Messrs. Weiss and Co., of London, and designed also by a double manœuvre to nip through the inner coats and seize the mouth of the vessel so as to twist it; but he said he had not found the instrument successful in actual practice.]—*Medical Press and Circular, Feb.* 23, 1876, *p.* 153.

48.—THE TREATMENT OF NÆVUS.

By Dr. JOHN DUNCAN, M.A., Assistant-Surgeon, Royal Infirmary, Edinburgh.

For practical purposes, nævi may be divided into two classes—those which are stationary, and those which are spreading.

Of the former, so large a number disappear, and the cure by nature is so much safer and better than the cure by art, that the first proposition which I have formulated admits of few exceptions. Two exceptions may be made, viz., (1) when the nævus is exceedingly small, and (2) when the means of cure are absolutely innocuous.

Nævi about the size of a pin's head, and seated on the skin, are not uncommon on the face. They sometimes spread, they are very enduring, and it is therefore well to destroy them while yet small. The best method is to puncture the little spot with a needle previously dipped in strong nitric acid. This is simple, certain, and leaves no visible mark. It may be destroyed with equal certainty by the heated needle, by the galvanic cautery, or by electrolysis; but these measures are inferior in simplicity and are prone to leave a more distinct cicatrix.

Of all the modes of treatment which have been proposed, pressure is probably the only one which can be called absolutely innocuous. Unfortunately, it seems equally innocuous to the nævus and the patient. Even its advocates demand a suspiciously long time to effect a cure thereby. It is evidently only in some situations that pressure can be continuously kept up; and in these the prolonged annoyance from the use of the necessary apparatus outweighs the slight chance of cure. I have sometimes, when a nævus of small size is situated over a bone, as on the forehead, advised the application of collodion every second or third day. A considerable number gradually disappear during the process; but I have not satisfied myself that the disappearance is its effect. It has, perhaps, the merit of keeping the patient's friends for a time harmlessly amused.

From this verdict of non-interference in stationary nævi, yet another exception must of course be made. I allude to those which persist beyond the age of puberty. The hope of a natural cure is then gone, and the deformity which they produce thus becomes a justification for treatment. They may be referred to the same category and be subjected to the same remedies as the spreading nævi which we have now to consider.

In this, the second class into which I have divided nævi, it is perfectly justifiable to interfere. Extreme slowness, or extreme rapidity of increase, may sometimes warrant delay. Thus, if the growth be very slow, and getting slower, it may be right to await a possible retrogression for a limited time. In other cases, from the very rapidity of growth, it is difficult to see how any interference can be effectual. I have watched a case in which, at birth, the only trace of nævus was a small mark on the temple, supposed to have been produced by a bruise in delivery. Within a fortnight, little patches of nævoid skin were observed over the side of the forehead, head, cheek, and

palate, which speedily coalesced and formed a prominent mass, closing the eye, pushing forward the ear, and greatly enlarging the upper lip. It was impossible to contend with the growth; but it is satisfactory to be able to add, that now, three years afterwards, it has spontaneously almost disappeared.

With these exceptions, however, I believe that we ought to attack every spreading nævus. To this variety are due what risks in the way of hemorrhage and ulceration may attend the disease; and while, no doubt, the majority would, if left alone, end by disappearing, yet, in the remainder, the operation which has ultimately to be performed becomes more difficult and dangerous exactly in proportion to the size of the growth. At the same time it must, as already said, be borne in mind in choosing measures, that our justification in operating is the deformity and inconvenience, rather than the danger of the disease; and that, although these may warrant us in running a moderate risk, it is a strong argument against seriously hazarding the life of the patient. The same considerations ought also to make us careful not to undertake an operation, of which the result is more unsightly than the disease; nor, in eradicating swelling and discolouration, to leave a face slashed with scars, "as if it had been operated upon for double harelip."

The means at our disposal may be divided into two classes—(1) those by which a scar is avoided; and (2) those which necessarily leave a cicatrix of greater or less magnitude. If these were of equal value in other respects, it is plain that the former ought always to be preferred. But, unfortunately, this is not the case. Those which involve destruction or division of the skin have the advantage of greater certainty and rapidity in producing a cure; and although the subcutaneous methods of treatment are in most cases less dangerous, this quality is not sufficiently pronounced to render them preferable when a scar may be unimportant. I think a general rule may be laid down that in operations on the face and other exposed portions of the body, the first class ought to be used, because they avoid disfigurement, and because, although a single operation may not suffice, repetitions in the end succeed; but that, on the other hand, the more rapid and certain methods should be applied elsewhere.

The first class aim at the destruction of the texture of the nævus, or the coagulation of the blood which it contains, by agents which can be introduced through minute punctures of the skin. The means used are the injection of coagulating fluids, the introduction of setons, the subcutaneous ligature, electrolysis, and the galvanic cautery.

Many different fluids have been used as coagulants. They all have a double action, in securing coagulation, and in setting up an inflammatory action, which tends to obliteration of those vessels which may have escaped their direct effect. The most reliable appear to be perchloride of iron and carbolic acid. Their special advantages are that they are powerful coagulants, and that while their caustic properties excite inflammation, this inflammation has little tendency to pass beyond the adhesive type. One danger attends them which limits their applicability. A considerable number of cases have been recorded in which a rapidly fatal issue has followed the injection. This appears to have been due to the escape of the fluids or clots beyond the limits of the nævus, and consequent coagulation of the blood in parts essential to life. At all events, it is certain that, unless the circulation through the nævus can be thoroughly controlled by temporary ligature or otherwise, injection ought not to be performed. Another danger, or rather difficulty, also deserves attention. It is by no means easy so to apportion the amount of injected material to the size and viability of the tumour that, on the one hand, the action may be sufficient to obliterate the vessels; and, on the other, not so severe as to cause the whole mass to slough off. I have seen in careful hands, in one instance, the upper lip destroyed; and, in another, ectropium produced by destruction of skin in the eyelid. Care should be taken that the fluid injected be distributed over the growth in minute portions; and the surgeon should be careful to do less at one sitting than *is necessary* for obliteration, trusting rather to repetitions of the operation, *which ought* not to be made at too short an interval. I believe that a pre-

liminary disruption of the texture of the nævus with a tenotomy knife is advantageous, by permitting greater diffusion of the coagulating fluid, and therefore a greater effect with a smaller quantity than otherwise would be the case. With these precautions, that the circulation be controlled, and the amount injected kept within due proportions, I believe this method of treatment to be the best we have for nævi of moderate size situated on the face, if they be mainly subcutaneous. It is safe, very successful, and leaves no scar.

The passage of setons, and the subcutaneous ligature, are remedies allied to each other in their effects and mode of action. They obliterate vessels, excite inflammation, and bring to bear on the growth the contractile effect of a scar. Setons, whether simple or steeped in an irritating and coagulating fluid, appear to offer no advantages over, and in some respects are decidedly inferior to, the subcutaneous ligature. They are inferior in the large number of suppurating orifices, and consequent cicatricial marks which they produce. The subcutaneous ligature, moreover, has the advantage of at the same time exciting inflammatory action, and cutting off a large part of the vascular supply. It may be made of various materials—cord, silk, or wire. I have lately used the elastic ligature with good effect. To establish it in position, a strong cord must first be passed round the growth subcutaneously. This can be easily done in the largest nævus by bringing out the needle once, or at most twice, in the course of its passage round the circumference. But if it be intended to draw through an elastic ligature by means of the cord, the needle in a large naevus should be brought out three, or even four times, that too great a strain may not be made on the elastic. Lest even then the elastic ligature should break during traction, I have always left the cord long enough to be attached to another. When the ligature has been established, the cord may of course be withdrawn. The advantages of the elastic material are the continuous tension which it maintains, and the ease with which the tension can at any time be increased. In order to prevent the knot being drawn under the skin, I use a metallic button with slits, into which the ligature passes when stretched, and which accordingly holds it when relaxed. To render it still more secure, the ends may be tied together over the button.

The method of subcutaneous ligature is not without its drawbacks. It necessarily produces a certain amount of suppuration, and in some cases this is accompanied by considerable constitutional irritation. I had lately a large nævus of the back sent to me by Dr. Macnee of Inverness. It measured 4 by 3½ inches, and was of great thickness. Dr. Macnee had already used setons, but although for a time they appeared to do good, ultimately the nævus increased again with great rapidity. I established an elastic ligature which came away in ten days. During that time the child (a few months old) was restless, feverish, and had a good deal of diarrhœa, as had also been the case when setons were used. The nævus shrivelled and diminished greatly, but I have since heard that it has not disappeared. I mention this case as the most unfavourable I have had, because it shows that the result of the subcutaneous ligature is not absolutely certain, and that sometimes it causes anxiety from constitutional irritation—an effect which we might expect from the analogy of teething. I am of opinion, however, that these large nævi are best treated in this way. Excision would be a severe operation in so young a child, and the raw surface left by external ligature would be very great. On the other hand, had the case I have mentioned, in which I was warned of the constitutional irritability, come before me now, I should have proceeded by the next method to which I have to refer—electrolysis, as being, although tedious, not prone to cause constitutional disturbances.

Electrolysis may be performed in two ways, viz., with and without insulation of the electrodes. When the needles are not insulated, the operation consists simply in causing more or less complete sloughing of the nævus. The sloughs are precisely similar to those made by caustic acids, if the positive pole be used mainly or alone; to those made by caustic alkalies, if, as is better, the use of the negative predominate. This method, therefore, is one that leaves a scar, and offers no advantage over destruction of the

growth by caustic, except, perhaps, in being somewhat less painful; no advantage over ablation, except that the scar is somewhat smaller. I have used the method, when the skin was largely involved, by passing fine needles under and parallel to the skin. It occasionally does good, especially when combined with other measures; but really no treatment, except entire destruction of the skin, is thoroughly reliable in these cutaneous stains. Electrolysis with uninsulated needles has a very limited application. Electrolysis by means of insulated needles might be regarded as our best method of curing nævi, but that it is more tedious than injection, less certain than ligature. The needle is insulated by means of vulcanite. The exposed point is made to correspond to the size of the nævus, and care is taken to bury it completely in the growth. The strength of current may vary between three and twelve cells of Weiss's Smee's battery, according to the distance between the poles, and whether or not anæsthetic be used; and the duration of the action is determined by the feeling of hardness produced. Both poles should be inserted, because the current is then more effective, *i.e.*, the resistance is diminished, and there are two points of action. The number of needles will vary with the size of the tumour. I have already, in a former paper, related a number of successful cases. I would now merely summarise the conclusions of a fuller experience.

1. In a large number of operations, I have never met with an untoward result. In two cases of nævi situated on the head, I have observed alarming pallor come on suddenly during the operation, but I have been inclined to attribute this to an overdose of the anæsthetic, because in the same patients subsequent operations were performed without this disagreeable concomitant. There is a tendency to administer an overdose, for the patient, when apparently fully anæsthetized, is often roused by the closure of the circle, and more chloroform is given to quiet him. I may remark, that it is generally necessary to anæsthetize. The operations are prolonged and painful.

2. With moderate care, sloughing can be avoided, and suppuration ought never to be seen.

3. With perseverance a cure may always be effected.

4. But, on the other hand, electrolysis by this method is extremely tedious and troublesome. I find from experience that no advantage is gained by repeating the operation oftener than once in three or four weeks, and that in a nævus of moderate size five or six operations are required.

5. I have already referred to the difficulty of curing a nævoid discolouration of the skin. The remark applies to the treatment by electrolysis, as well as to all other methods. A case sent me by Dr. Williamson, of Leith, illustrates this. The entire parotid region, auricle, and upper part of the neck on the left side, were occupied by an ill-defined, large, and prominent nævus, over which the skin was everywhere discoloured. By electrolysis the parts were rendered absolutely flat; but the skin became white only in the centre over a space the size of a crown, although, in this instance, I tried what in others I have found advantageous, the painting of the surface with nitric acid, blistering fluid, iodine, and other irritants.

There is yet another mode of using electricity, which I believe will come into more general use,—the galvanic cautery. It may be used subcutaneously with perfect ease. The platinum wire is placed in position in the growth, and a hollow needle is threaded on each end, pushed along it through the skin, and then connected with the battery. The motions imparted to the platinum wire will of course determine the amount of tissue cauterised. The contractile properties of the scar of a burn render it unnecessary to produce extensive destruction, and it would be advisable rather to trust to a repetition than run the risk of producing a slough. I have applied the plan only once to a nævus about the size of a pigeon's egg on the shoulder, and although I made a very limited use of the cautery, the growth afterwards gradually withered. I believe that, but for the cumbrous and costly apparatus required, it would supplant the seton and subcutaneous ligature, because it is not attended by suppuration.

There are three methods of treating nævi which necessarily leave a scar—

excision, ligature, and ablation. They have this in common, that the cure is certain.

The danger of bleeding when excision is performed was at one time much exaggerated. It is now well known that in almost every case nævi are encapsuled. The capsule is doubtless formed, as in other tumours, by the pushing aside of surrounding textures during the growth of the adventitious structure. But, as in other tumours even of simple character, a loose capsule cannot be relied upon. Under pressure or other form of irritation the distinction between the growth and its surroundings is lost in adhesions. This gives rise to a difficulty in dissection, which is usually of little moment, but which is a source of danger in the neighbourhood of important parts. Mr. Teale's operations, doubtless, show the possibility of excision in most unpromising situations, but such operations are more formidable than the disease warrants, and in many respects are inferior to other measures. Excision is inapplicable in the face, because it leaves a scar, and because it does not cure with certainty the nævoid skin. It has disadvantages in the body, because there is a certain amount of bleeding at the time, and possibly some risk of reactionary and secondary hemorrhage. It ought, I think, to be restricted to nævi which are subcutaneous, which are situated on a part of the body usually covered, and which are not of large size. For these, it is rapid, clean, and certain.

Ligature, on account of its safety and certainty, is justly regarded as the proper mode of treatment for nævi not on the face, and which can be completely encircled by the cord. The exceptions are those just mentioned as suitable for excision, and large nævi in which the destruction of skin would be excessive, and the scar would injure the usefulness of surrounding parts. I do not think that ablation presents any advantage over ligature. The scar is equally large, the healing is not more rapid, and the security from hemorrhage is not so great. Still, if it be at any time necessary to remove a nævus of the tongue or inner surface of the mouth, ablation by the galvanic cautery is plainly the best procedure. In such situations, methods which depend for their efficacy on inflammation or suppuration are inapplicable, and the presence of a ligatured mass which could not be prevented from putrefying, would be singularly offensive and even injurious.

I have not thought it necessary to detail, merely for the purpose of condemning, the thousand-and-one remedies which have been applied to nævus. Besides those I have mentioned, I do not think there are any of practical importance. We may have to vary our treatment according to the circumstances of the case, but our choice is really limited to a few measures, of which ligature, injection, and galvanism are the most prominent.—*Edinburgh Medical Journal, Feb.* 1876, *p.* 703.

ALIMENTARY CANAL.

49.—ON CLEFT PALATE.

By Dr. E. A. Rawson.

Finding the usual means for approximating the edges of a cleft palate tedious, to say nothing of their difficulty, I have devised a little instrument which I believe will facilitate the operation very much. It was made for me by Weiss some months ago, and since then I have not had the good fortune of a case to try it on. I therefore venture to suggest my plan to the profession in general, and trust that any one approving of it will try it and publish the result. The instrument is simply a safety-pin, or rather needle, used on the same principle as that for fastening children's clothes.

It is about three-*quarters* of an inch long and slightly curved; at its head

is a flat silver knob, to which is attached a spiral silver spring; this spring is shorter than the needle, and on stretching it a sheath at its free extremity receives the point of the needle.

The edges of the cleft having been pared, the needle is passed in through one and out through the other, giving a good grip to secure apposition, and going nearly or quite through to the back; the silver sheath fastened to the spiral spring is then drawn across and receives the point of the needle, thus retaining the latter in its place. Two, or as many more needles as are required, can be applied, and when union is complete, can be withdrawn by pulling the sheath from the point of the needle and taking the latter out in the usual manner.

Of course all this must be done by means of handy forceps.

The pared edges of the cleft might also be held in apposition until union had taken place by means of a small trout-hook, fastened to each end of a spiral silver spring half-an-inch long; india-rubber, I fear, would soften; one hook held in a forceps to be plunged into one lip of the cleft, the other hook to be then seized and drawn across, extending the spring, and secured in the opposite lip; the barbs, I think, might be left on the hooks, as they would make certain of retaining them in their places, and every angler knows how to withdraw a *small* barbed hook—viz., by making a slight nick in the flesh at the back of the barb, pressing the hook slightly onwards, then outwards into the nick, when it will easily withdraw. This experiment can be tried on a piece of cloth.

Or, instead of a spiral spring, the hooks might be fastened to a piece of silver wire, which, when they were applied, could be twisted until the pared edges were in apposition.

I would recommend the very smallest trout-hooks, as larger ones might pierce through into the posterior nares, and when the soft palate was raised seize the opposite lining membrane. I can see an objection to the hooks, for in using them the back of the wound would not be in such close approximation as the front, but they would be much easier of application than the safety-needle, which, however, has the advantage that it would retain both back and front of the wound in perfect apposition.

In one case, that of a child, 2½ years old, in which half-an-inch of the bony palate was cleft, I used the actual cautery as above, afterwards stitching with three wire sutures, which, however, all gave way. Some time afterwards I received a letter from the mother to say that the cleft had healed, leaving a white seam in its place, and that the child could speak quite plainly. I went to see it, and found the cleft *partially* healed and the remaining part in such close approximation as to deceive a superficial observer.

Vesico-vaginal fistulæ and such like deep and difficultly situated lesions might be found easier of treatment by the foregoing.—*Medical Press and Circular*, *Feb.* 2, 1876, *p.* 88.

50.—ON HARE-LIP AND CLEFT PALATE.

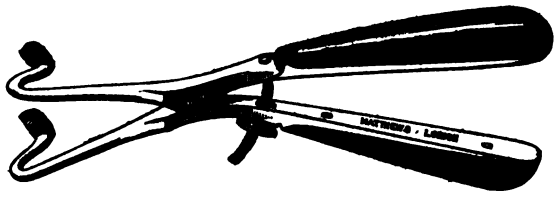
By Sir William Fergusson, Bart., F.R.S., Surgeon to King's College Hospital, &c.

[In April, 1874, Sir William Fergusson had only had experience of his new operation for the cure of cleft palate in four cases (*Retrospect*, Jan. to June, 1874, p. 217). The number in which he now has had similar experience amounts to eighty-two.]

Experience has led me to make some modifications in practice formerly described, which I fancy worthy of the object of this present paper. In dealing with a cleft in soft and hard palate, I still adhere to my preliminary division of the levator palati on each side; but if from the size of the gap in the hard palate it be deemed needful to introduce one, two, or more stitches, I advise that the holes for them be bored with the bradawl, and that the stitches be introduced before the chisel is applied. I think it an advantage,

too, to make the edges of the gap bare before loosening the portions of the palate with the chisel. If these parts be made loose first, it is very difficult to push a bradawl or needle through, and there is great risk of one or both slipping, so as to separate periosteum from bone and endanger the occurrence of necrosis. This I believe to have been the cause of the misfortune in the two cases above referred to, when the operations signally failed. But I fancy I have further modifications and improvement to impart here. Recent experience has led me to the fact that stitches may not be necessary in many instances of cleft in the hard palate. I have found again and again that, when the edges of the gap have been pared and the chisel introduced, it answers to cause approximation of the raw margins by stopping the opening made on the hard substance by the chisel, with lint, so as to make the desired closure in the centre. The pledgets of lint keep the parts as steady as, if not more so, than the stitches, whilst they obviate the necessity of the additional injury of the stitch-punctures. This practice, I am confident, is available in all instances when the opening in the bones is of brief extent, as the front stitch in the soft palate may be put in close behind the posterior margin of the bones.

In my former paper I referred to gags, and particularly to those of Mr. T. Smith and Mr. Wood. For various reasons, which need not be dwelt on here, I have set these aside in favour of a more simple apparatus, chiefly suggested by my friend Mr. Mason, of St. Thomas's, and in a manner perfected by Messrs. Matthews, instrument-makers in Carey-street, which I strongly recommend as the best I have yet seen for the operation in question. In fact, I consider the gag as an essential instrument for the modern proceeding, for without it chloroform would be worthless. This sketch shows the instrument in question.



The narrow blades are introduced shut between the teeth on either side the surgeon chooses, and are opened by pressure on the handles at the will of the assistant who holds them. The power of the instrument is such that, if care be not taken, the lower jaw may actually be luxated, as I have seen more than once, although happily with no permanent evil. There is a peculiar twist in the blades of this instrument as regards the cheek and margin of the mouth, which can be better appreciated by looking at them in action, than from any description that might be given here. The length of the whole instrument is about seven inches, and it will be useful to have two, one slighter than the other to suit the mouths of patients from four to ten years of age. This gag will be found of much value in many operations about the mouth and tongue, and I presume to say that it will prove a valuable aid to the dentist.

On thinking over all that I know of these matters, and especially as regards my own humble work, I am impressed with the slowness with which facts and improvements have come upon my mental conception. I believe that I was the first who dissected and described the anatomy and physiology of cleft palate (cleft, be it observed), yet five years or more passed before the simple mechanical value of the information thereby obtained dawned on my mind. Neither the action of the levators in tugging upon the stitches, nor that of the superior constrictors of the palate in closing the cleft during deglutition, were thought of; but happily, when tenotomy and myotomy were in the full swing of novelty and fashion, I bethought me of my old dissection, which, having been fortunately preserved as unique, gave me the opportunity of *further study* and reflection. Yet even now, after a compara-

tive calm in my own mind, I am amazed at the slowness with which point after point has gradually come upon me in an experience of between three and four hundred operations, including old fashioned and new. These latter observations have been more impressed on my mind within the last two years than at any previous date.—*British Medical Journal, Jan.* 1, 1876, *p*. 3.

51.—THE USE OF LIQUOR BISMUTHI FOR HEMORRHOIDS AND PROLAPSUS ANI.

By Dr. JOHN CLELAND, F.R.S., Professor of Anatomy and Physiology, Queen's College, Galway.

[It is evident that in a large number of cases of hemorrhoids operative interference is inevitable, but it is desirable to avoid so disagreeable a mode of treatment as much as possible. With this end he recommends the use of liquor bismuthi as an enema.]

My attention was first drawn to this remedy by a rather peculiar case of prolapsus of the bowel. A middle-aged woman came for consultation in such a condition that she could with difficulty walk, inasmuch as whenever she parted her thighs, the bowel emerged and hung down for about six inches, in folds of such a character as made it evident that at least half a yard of intestine was extruded. The whole surface of the mucous membrane exposed was a deep raspberry red, like those cases of hemorrhoids which some practitioners delight to treat with nitric acid. This condition was chronic; external supports had failed; the possibility of removal of the whole prolapsed mass suggested itself, but such an operation attended with enormous risk was not to be thought of in the case of a patient enjoying a certain measure of health. Astringents had been tried and failed, and it seemed questionable if astringents were the most suitable remedies in such a case. It appeared much more probable that an irritated and congested condition of the mucous membrane led to a derangement of the action of the muscular walls than that in a strong woman, a local relaxation, involving sphincters and intestinal walls, had produced a prolapsus, which led to congested mucous membrane, from exposure. I recollected the relief frequently obtainable in cases of hemorrhoids, by application of white bismuth or oxide of zinc. In this case, however, ointment or powder obviously could not be effectually applied. But the liquor bismuthi in stomach affections has a soothing influence far superior to white bismuth. I therefore directed my patient to mix a dessert spoonful of liquor bismuthi, with half a wine glassful of starch, and after getting into bed and returning the bowel to its place, to introduce this enema and retain it. I was much pleased, a few weeks afterwards, by my patient calling to tell me that she was nearly well, and to ask if she might continue the remedy. This she was ordered to do; and I have every reason to believe that she has had no return of her malady. I have since frequently used the same remedy for the ordinary prolapsus in children, with invariable and rapid success.

In severe hemorrhoids there are usually three parts affected, the integument, the mucous membrane, and the hemorrhoidal veins. Plainly the veins cannot be reached by local medicaments, and those comparatively few cases in which they alone are involved must be treated in other ways. The integument, together with the edge of the mucous membrane up to the grasp of the sphincter, is within easy reach, and may be treated in various ways according to circumstances. Thus, when the congestion is superficial and produces a catarrhal oozing, bathing with whisky or other alcoholic lotion, a small pad of dry cotton-wool firmly applied to soak up the moisture, and also zinc or bismuth in powder or ointment are all exceedingly useful; and when a congested surface within easy reach is accompanied with venous *engorgement*, tincture of iodine sometimes produces surprising effects, although in other instances it is too painful to be borne. But when the mu-

cous membrane is considerably involved I know no application to compare with injection of liquor bismuthi, which has the advantage of being painless; and, as in the case of prolapsus narrated above, the improvement of the mucous membrane has a wonderful influence on both the veins and integument. In instances in which the necessity for surgical interference appeared indubitable, I have had the gratification of defrauding myself of the pleasure of operating, and of seeing the patient recover. This is the more gratifying, as the surgical treatment of hemorrhoids labours under the disadvantage, that, no matter what be the particular operation adopted, it never removes the predisposing cause of the malady.— *Practitioner*, *Jan.* 1876, *p.* 54.

ORGANS OF URINE AND GENERATION.

52.—ON THE TREATMENT OF URETHRAL DISEASE.

By Sir Henry Thompson, Bart., Surgeon Extraordinary to H.M. the King of the Belgians; Emeritus Professor of Clinical Surgery in University College Hospital.

The treatment of urethral disease of which I complain has its origin in the notion that the urethra is a mere flexible tube, closed at or near its junction with the bladder by some kind of muscular apparatus, sphincteric or otherwise, through which fluids will pass indifferently in either direction. No idea, however, can be more erroneous, and treatment founded on it must be defective.

At the outset, then, let me say that it is absolutely essential that you should have a tolerably accurate knowledge of the nature and functions of this so-called tube.

The urethra is not a tube at all, in any sense in which we employ that word. It is not like a gas-pipe, or an india-rubber tube, or even a flaccid tube of any membrane whatever.

It is rather *a continuous closed valve, capable of transmitting fluids and solids in one direction only, and transmitting nothing whatever in the opposite direction, except in obedience to applied force.* Its length in the male makes us think of it as a tube, but this is a mere accident of sex. An inch or less is amply long enough for its urinary function, as in the female; and all the length it possesses above that is quite useless *as a urethra*, and renders it liable to disease and accident—the price, and a heavy one, let me tell you, which the male pays for his specially distinguishing feature. In illustration of this I have but to refer you to the innumerable difficulties and dangers associated with stricture, retention of urine, and calculus, which are almost unknown in the other sex. It is, then, in the male simply a long valvular chink, traversing soft and most delicate vascular and nervous tissues, always firmly closed, and never opening except for a few seconds, during which fluids have to be transmitted from the body. Then, for a few seconds, it is distended more or less, and becomes a tube if you please, for this short time and this only, equalling, perhaps, at most three minutes in the twenty-four hours. All the rest of the time it is firmly closed, and not one drop of fluid can pass from the bladder. Of course, oozing of liquid which is generated in the walls of the tube, or which enters it by ducts may escape, but always, inevitably, in the outward direction only.

Now, during these few seconds, when the valve may be said to occupy the form of a tube, I have next to observe that it is a tube of very varying diameter in its different parts; it is, in fact, very differently distensible at different places, being surrounded by different structures. This fact has long been known and generally recognised.

Having thus far illustrated briefly, and necessarily somewhat imperfectly, the nature of this valvular passage, let us see how far the ideas which I want

you to acquire relative to the urethra affect two important points in practice. First, that simple matter of making an injection into the urethra. You have to introduce a fluid for the purpose of therapeutic contact with the walls of this closed passage; you have to distend it, and some little force is necessary; not a single drop can enter, much less run down into it, unless the liquid is forced in by a piston, while the orifice of the urethra is carefully closed around the tube of the syringe introduced. The walls of the passage lying closely applied to each other become opened only by the pressure of the fluid driven in, and they are distended just so much and so far as the quantity employed determines. Thus you may safely reckon, as the result of my observation, that a syringe containing one fluid drachm is amply sufficient, and that it will distend the urethra for three and a half or four inches. A half-drachm syringe often suffices. It is scarcely necessary to say that these small instruments are much more easily managed by a patient than larger and longer ones. But most patients, unless specially taught to use the syringe, never introduce any injection at all. Unless the orifice of the urethra is carefully closed at the time, the fluid simply leaves the end of the syringe and flows out by the external meatus; and in every case after the injection has been made, the moment the orifice is unclosed the fluid is rapidly expelled by the contractile force of the urethra, and no appreciable quantity remains within. So much, then, for any fear of its running down to the neck of the bladder. Of course, if an injection is too strong—in my opinion a very frequent occurrence,—the anterior part of the urethra is inflamed, and extension backwards may easily take place; but that is no part of our subject now. But let me further say that, so far from your being able, even with the power of the syringe, to send an injection into the prostatic part of the urethra, you cannot do so by any ordinary force, unless you can at the same time voluntarily relax the muscles which surround the membranous urethra, and so allow the fluid to pass—a thing perfectly possible with very little practice to accomplish. Thus it is that you cannot inject the bladder except by passing an instrument into its cavity. In fact, this valvular passage stoutly resists all intrusion from without, and admits no fluid except in obedience to pressure which it is unable to resist.—*Lancet*, *Nov.* 27, 1875, *p.* 759.

53.—ON THE DIAGNOSIS OF DISEASES OF THE URINARY ORGANS.

By Sir Henry Thompson, Bart., Surgeon Extraordinary to H.M. the King of the Belgians, &c.

I advise you always to pursue a uniform method. Order and uniformity are essential elements in directing the necessary investigation; and after much thought and experiment, for my own private guidance as well as for yours, I have adopted the following system. Relative to the class of diseases we are studying, there are three methods of obtaining the facts required:—Firstly, by questions of the patient; secondly, by physical examination of the body; thirdly, by examination, chemical and otherwise, of the secretions.

First, by questions. There are four chief questions which I always employ, and always in the same order. They ought, with the minor inquiries which branch out of them, to determine six out of seven cases which come to you. They relate to four signs and symptoms more or less met with in patients affected with complaint in any part of the urinary organs. Frequent micturition; painful micturition; deviation in the character of the urine itself from the healthy standard; the addition of blood to the urine.

The first question, then, which I invariably ask to any patient so affected is, "Have you any, and, if any, what frequency in passing water?" Then, as a branch of that question, springing out of it, I ask whether the frequency is more by day or by night, or influenced by movements, or by any *particular circumstance*? How the question applies I will tell you afterwards.

Then, secondly, I ask whether there is pain in passing urine, and whether before, during, or after micturition? Inquire also if pain is felt at other times, and if produced or aggravated by quick movements of the body. The locality of the pain is also to be precisely ascertained.

Then I ask, as a third question, "Is the character of the urine altered in appearance, or is there anything unusual in the stream itself? Is the urine turbid or clear?" Possibly the patient will tell you that it is turbid, but you find, on questioning further, that it was passed perfectly clear, and only became thick after cooling or standing. Also, as arising out of this, you may often ask, "Does it vary much in quantity?" noting of course the specific gravity. The healthy standard, both as regards quantity and density, however, must be allowed very extensible limits, and both, I need not tell you, are very important elements in regard of renal disease. Then, as regards the stream itself, it may be small, forked, or twisted, or it may stop suddenly when flowing.

The fourth and last question is, whether blood has been passed in any way with the urine; whether the mixture is florid or brown, light or dark; whether the blood and urine are intimately mixed, or whether the blood is chiefly passed at the end or at the beginning of making water; or, lastly, whether it issues independently of micturition altogether.—*Lancet, Dec* 4, 1875, *p.* 793.

54.—ON PHYSICAL EXAMINATION OF THE URETHRA IN CASES OF STRICTURE.

By Sir Henry Thompson, Bart.

[At the beginning of the present century, and the tendency still exists to a certain extent, instruments were employed too readily, and instruments also which are liable to injure the urethra.]

There are few structures more delicate than the male urethra. Formed of an internal membrane of great tenuity, surrounded by elastic and muscular fibres, interpenetrated everywhere with ducts, fine blood-vessels, and nerves; the whole surrounded in front of the prostate with one of the most elaborate of vascular structures, known as erectile tissue; add to this the sensitiveness to pain of the internal membrane, equalling the conjunctiva in that quality, as any one person may learn for himself by passing the softest instrument he can find. Lastly, and more important still, it possesses another form of sensibility, of a much graver kind, which even the last-named membrane does not possess: I mean a strong tendency to arouse, in the entire nervous system, a state of excitement, evidenced by the striking phenomena of rigors and subsequent fever and prostration, when slight mechanical injury has been done to any portion of it. Now let this picture of the urethra as it is, never be absent from your mind's eye when you put an instrument into it, and both you and your patient will profit. When, therefore, a young man consults you for certain troubles relative to which you desire to learn whether urethral obstruction be a cause or not, do not be tempted for an instant to adopt so unnecessary a course (to say the least) as the introduction of very large instruments, or instruments with huge bulbs at the end of them. But simply take a flexible English gum-elastic bougie, well curved towards the point, with a blunt end (since a tapering point, of course, will not mark distinctly the site of stricture), not larger, as a rule, than No. 10 or 11 of our scale, and pass it very gently and slowly into the bladder. If it goes easily—above all, if it is withdrawn without being held, and slides out with perfect facility, take my word for it he has no stricture, and, *quoad* obstruction, wants no use of instruments whatever.

I dare say I shall be told by some one, that there may be a urethra through which No. 11 can be made to pass, yet which is, nevertheless, the subject of some degree of stricture which it is necessary to treat. Well, I do not deny the existence *of that* exceptional case. But such an example is very

rare, and, further, no man who has the slightest delicacy of tactile sense in his fingers can fail to observe the difference between a No. 11 bougie sliding out with facility, and one which is grasped somewhat as it is withdrawn. This difference is always manifest in the two cases, and is, indeed, very notable. But supposing that the No. 11 stops at any point, and you have assured yourself that it is not one of the natural obstructions to the passage of an instrument through the urethra, of which I shall have to speak hereafter, you will try a smaller instrument of the same kind until you have arrived at one which does pass through and inwards into the bladder. But you may also test your observation by passing a soft tapering French bougie—11 or 12 English size,—and if it is a *natural* obstacle which at first checked your blunt-pointed bougie, the former instrument will probably slip through without trouble.

Now, with reference to these bulbous-pointed flexible explorers, nothing is more easy, especially with an unpractised hand, than to deceive oneself with respect to the existence of stricture by means of them. If not drawn out accurately in the axis of the passage, you may feel a check, and readily find what you believe to be a stricture in the most healthy urethra. And that is precisely what I am so anxious to guard you against; for, in the hands of designing persons, these instruments may be turned to most unworthy purpose. For men outside the ranks of our profession, or holding a questionable position on its outskirts, these instruments are the very thing. That is an additional reason why we should be careful not to encourage their unnecessary use. I have used small bulbous instruments in metal for the diagnosis of narrow and confirmed stricture, on which it is desirable to operate, for twenty years, but for slight stricture never; and I have protested against their use on the two grounds already named; first, that for such the instrument inflicts needless pain; secondly, that it is liable to deceive a young operator not too adroit or familiar with its use.

But now, in the second case—not that of the young man, but of the patient who has a confirmed stricture,—the diagnosis has probably to be conducted with more attention to detail. I proceed as follows, making what may be called a "survey" of the passage. I commence by passing the soft, blunt-ended English gum-elastic bougie as far as it will go; and when this stops, as it may do within an inch or less of the orifice, I make a note of the distance, and next find what will pass with tolerable ease through the obstruction met with. Very likely a No. 4 or 5 (similar instrument to the preceding) will do so, and it may be then carried further to seek another check, which is not unfrequently met with at about five inches from the orifice. Through this, after a trial or two, a very small gum catheter—say No. 1 or 2—may probably be passed into the bladder, drawing off some urine, and so assuring you of its position. I know then the patient has, at all events, a narrowing near the orifice and another at the distance named. I may verify this at once with a bulbous instrument if I choose; but as long as the anterior narrowing exists, it is as well to postpone more minute research until it is divided, as considerable narrowing at that part always requires to be. Such a one, indeed, is never advantageously treated by dilatation. This being done, the No. 11 blunt-ended bougie is passed, and we learn whether any contraction exists in the interval existing between it and the spot originally marked at five inches. If there is one the stopping of the bougie will indicate its situation. But if the bougie passes easily to the point just named, the canal is sufficiently open, and we have arrived at what, in ninety-nine cases out of a hundred, is the only remaining stricture; for it is rare indeed, where a narrow stricture exists at that distance from the meatus, that any other will be found beyond. This has next to be dealt with, and, as we are speaking now of old and confirmed cases, there is little doubt that the best treatment will be internal urethrotomy. How to accomplish that most perfectly will be discussed in my lecture on that subject.

A word or two about the bulbous exploring instrument. It should, in my opinion, be of polished metal mounted on a slender metal rod or shaft. No *other material* slides so easily and smoothly through the urethra; and the *necessity* for it is, after all, not great, so that to employ one which produces

much irritation, passes roughly, or distends unnecessarily, is to pay too high a price for the small amount of information it may convey. I am free to say that, although I used the metal bulbous instruments in the earlier part of my career, I can now, with more experience, attain all that is necessary without them. It is said that they enable you to ascertain the length of a stricture. In reference to this, let me tell you, first, that considerable narrowing almost never affects the urethra for any great distance. The passage is often partially implicated for half an inch behind and half an inch before the maximum point of narrowing—an important practical point in relation to operation; but the very narrow spot, which is what the exploring bulb indicates, is almost invariably short, within a quarter of an inch in extent. Secondly, you must take into consideration the fact that the mobility of the mucous lining of the urethra will deceive you if you are not aware of it. A very little pressure in front, on entering the stricture, or from behind, in withdrawing the exploring bulb, if it comes rather tightly through, changes the situation of the contracted portion considerably in relation to its distance from the external meatus.

I repeat, then, if you have to deal with a recent stricture, such a one as you naturally intend to treat by dilatation, the introduction of a large bulbous explorer is wholly useless, only produces unnecessary pain, and tends to excite inflammation.

But in view of any internal incisions for a confirmed or obstinate case, the important thing is simply to know where the narrowed points of the urethra are, and then it is not difficult to apply your cutting instrument properly to them.—*Lancet, Dec.* 11, 1875, *p.* 827.

55.—ON THE BEST MANNER OF EMPLOYING INSTRUMENTS IN CASES OF STRICTURE WHERE MUCH DIFFICULTY EXISTS.

By Sir Henry Thompson, Bart.

I have now to consider the question, How are you to deal with a case of stricture of the urethra in which real difficulty exists in passing an instrument into the bladder? Let a case be supposed in which attempts have been made, perhaps by several hands, and hitherto without success.

First, let me point out in what the chief mechanical difficulties in such a case might consist. There are four:—

1. Extreme narrowness of the stricture.
2. The stricture may be tortuous.
3. It may be complicated with false passages.
4. The urethra behind the stricture may be irregularly dilated and reticulated.

Difficulties of another kind, not mechanical, are frequently met with; these are two in number, and are to be considered hereafter—viz., (1) the stricture may be very resilient, and liable to become narrower, and to produce absolute retention on any instrumental contact; and (2) any use of the instrument may produce in the patient an attack of rigors.

1. Let us consider first the mechanical causes of difficulty, of which the first is extreme narrowness.

In regard to this, the first thing you must do is to see the patient make water. The failures to pass the instrument may not necessarily have arisen from narrowing of the urethra or from tortuosity; there may be a false passage in the canal. It may, indeed, be that there is no stricture at all. No greater mistakes are made than those which occur with patients who have little or no stricture, either from the surgeon not knowing well how to pass the instrument, or from there being a false passage into which it enters, so that it does not reach the bladder at all. You are first, then, to see the stream of water, perhaps on more than one occasion, so as to

estimate it fairly, and you will judge by that what size of instrument is to be used. And always let the instrument correspond with the size of the stream which you see; but it should correspond only in this way—the instrument should be a little smaller. You will sometimes see a patient who scarcely passes a stream at all; the urine issues only in a succession of drops. This being his constant, and not a temporary or accidental, condition, how very small must be the instrument which is adapted in size to traverse the stricture.

The first step to be taken with such a case, after having ascertained, as I assume to have been done, the situation of the stricture, is to introduce very gently the smallest English gum catheter without a stylet, and try to insinuate it through the obstruction. For this purpose I have endeavoured to obtain some exceedingly small instruments, much smaller than any hitherto made.* This tiny catheter, which I show you, containing a slender steel thread rather than a stylet, may be used either with or without it. The value of this little instrument, after its extreme tenuity, is its ability to transmit a drop of urine through its interior, and so assure you of its position when the bladder has been reached, an assurance, I need hardly tell you, of great importance. It is worth while making a careful and somewhat prolonged trial, and if you succeed, the instrument is to be tied in at once and the route secured. If I fail with this, I then try a silver catheter of the smallest size.

But there is one very important matter in relation to the silver instrument—namely, that it is an extremely dangerous one in inexperienced or in incautious hands. Nothing is easier than to implicate its slender point in a lacuna, and if the slightest force be used, the point leaves the route and finds a track amongst the loose tissues outside the urethral mucous membrane, and thus a false passage is commenced. If you cannot train your hand to employ it with extreme lightness and delicacy, by no means use it. It should be held and moved with so much tenderness, that if the point meets with any resistance in its course, the fingers rather should slip down the shaft than communicate pressure to the instrument. Any kind of force in its use is not to be thought of—its only value is in its capacity for being insinuated between closely applied surfaces, and any sense of opposition to its point is a clear intimation that its route may lay right or left, but not straight on. It is not fit for the hand of a tyro, but when he is habituated to the use of somewhat larger instruments, the ability to use this will follow. A careful trial, however, with the very small gum catheter, first without and then with the stylet, will in many cases make this unnecessary; but these failing, I know no instrument so valuable as a very fine silver one with a little increase of size in the shaft, to render it steady. The final three inches should not exceed half the size of No. 1 of the English scale; the shaft should gradually rise to fully No. 2.

2. A stricture may be more or less tortuous; in other words, it does not necessarily follow the exact direction of the urethra.

It may be a little on this side of the axis or on that, not necessarily in the middle. You may see this sometimes in the dead body; and you may infer it from experience on the living. When you have to deal with a very narrow or with a tortuous stricture, there are two quite distinct systems of using an instrument, either of which you may employ. What I have to say, then, applies to the manipulation necessary in all cases of difficulty under the present and preceding heads; and I have reserved it therefore until now. First, the little instrument employed, whatever its nature, may be applied by what may be called "groping"—that is, by carrying the point in any and every direction, with the utmost care, of course, until by chance it has entered into the stricture, as you may feel by the sensation of the point being "held" or "grasped." For this purpose very slender solid instruments are made of gum-elastic, of catgut covered or not with gum, or of whalebone, since these can be produced of rather smaller size than the hollow instruments which I have just described. In order to add to the chance,

* *Messrs.* Weiss and Son have taken great pains to accomplish this for me, and have produced some slender delicate instruments, much smaller than No. 1, which have been of great service.

as is supposed, of finding the orifice, there are some of the first-named material, the ends of which are formed somewhat into the shape of a corkscrew, or are otherwise made to deviate from a straight line. All these are of French design and workmanship, but none have the advantage of being hollow, to demonstrate their presence in the bladder when they arrive there.

Now, I advise you not to rely on mere groping to find the orifice; it is exceedingly dull mechanical work to be constantly groping for a considerable time on the chance of success.

There is a method of search, however, conducted on a fixed principle, which I much prefer and always employ. I advise you to adopt that, or any other you can devise, provided that it be a systematic one, and also an exhaustive manner of making the necessary exploration and researches for the orifice of the stricture. Some of you have often seen me apply it to patients in the wards upstairs. According to this manner you proceed systematically and examine each side of the urethra *seriatim*. We will suppose the urethra to require examination on four sides—a roof, a floor, a right side, and a left side. You are to take your slender silver catheter and slide its point delicately along each side successively from the orifice to the place of obstruction. If the orifice of the stricture is not *exactly* in the middle line, and we may fairly believe that it rarely is so, then there is one side of the passage which will more easily lead into the narrow way than any other. If I go down on this side I shall probably not get into the stricture; but if I slide down gradually on the other I shall probably get the instrument in, because you see there is less obstruction on that side. Begin, then, by the roof. The roof is the firmest part, the least likely to furnish obstruction in the way of ducts or lacunæ, and by following it you will be most likely to carry the point in. The floor, on the contrary, is the softest, loosest, and most spongy part, and will be most likely to yield to the instrument and give way. If your first effort does not succeed, take the right side; if that does not do, take the left; if that fails, try the floor. If you are very careful you may make the attempt in this manner for thirty or forty minutes without doing any damage; but if the patient suffers, or if he bleeds, or if you are losing patience, give up the task, or you may make a false passage, and increase the difficulty considerably.

3. The existence of a false passage leading out of the urethra is another serious obstacle to the introduction of instruments into the bladder.

The principle which must guide your action here is to be very careful to avoid the side on which the false passage is. A false passage commences usually on the floor, and no doubt for a reason already mentioned—viz., the fact of the structures below being looser and more delicate than those above. When you examine a patient with a false passage, you may find the instrument passing to its very end, notwithstanding which no urine flows. Hence the false notion of stricture at the neck of the bladder. When the instrument has thus passed, put your finger into the rectum, and you will know instantly whether there is a false passage; for, if so, there are only the coats of the bowel, which are very thin, between your finger and the instrument, so that you feel it very distinctly; and very commonly not in the middle line, but rather to the right or to the left. But if the instrument is in the right passage, the whole thickness of the prostate, not always very considerable, is felt between it and your finger. It is almost always in the bulbous portion that the instrument leaves the urethra and gets under the prostate. What you are to do, then, is to withdraw the catheter two inches or so, pass it on again, keeping as close along the upper part of the urethra as you can, ascertaining by means of the finger in the bowel that the instrument is not passing into the old route. But when a false passage exists, it sometimes constitutes the chief obstacle to the introduction of an instrument, for, as I have before hinted, the stricture itself may be only inconsiderable. The size of the stream will help to determine this point; and if, so far from being a mere thread, it has a volume equal to a No. 6 or 7 catheter, use a No. 5 silver one, so that you can guide it, and try each side of the urethra successively until you discover which it is that enables you to clear the orifice of the false passage. Remember the result, and you have a

key to the difficulty which will enable you to overcome it with ease on the next occasion.

4. Difficulty presented by dilatation and reticulation of the urethra behind the stricture.

Suppose next, that, following these hints, you have carried the instrument through the stricture; there is a sort of grasp felt on attempting to move the instrument which is quite unmistakeable. But that very "grasp" which you are so satisfied to feel, makes it less easy to manipulate the point of the catheter after it is through the stricture, and you may have a source of danger to encounter in the urethra beyond. Thus the mucous membrane being sometimes reticulated from the presence of dilated lacunæ, it is easy to engage the point of the instrument in one of these, and make a false passage. Besides this, as the result of long continued fluid pressure and straining, the urethra behind the stricture is occasionally much dilated, and the whole surface is so irregular that it requires care and an acquaintance with this condition to traverse it safely. Here especially, with a small instrument already firmly grasped, you may require all the caution you can command in completing its safe course into the bladder.—*Lancet, Dec.* 18, 1875, *p.* 867.

56.—ON INTERNAL URETHROTOMY, AND ON THE INSTRUMENTS EMPLOYED FOR PERFORMING IT.

By Sir Henry Thompson, Bart.

There are various ways in which the operation of Internal Urethrotomy for Stricture may be done, and there are numerous instruments for the purpose. There are two different principles of action in making the necessary incision, and the instruments may be grouped in two classes by this means.

I. The stricture may be cut from "before backwards" on a guide previously passed.

II. Or a blade may be introduced through and beyond the stricture, which is then cut from "behind forwards," in which case a guide is unnecessary.

Before considering these, I may state, that the situation of a stricture is an important element in relation to the applicability of internal urethrotomy of any kind, and also as to its necessity as a mode of treatment. Thus :—

1. A stricture at or near the external meatus is always extremely undilatable, while at the same time it may be divided with the greatest ease, precision, and safety.

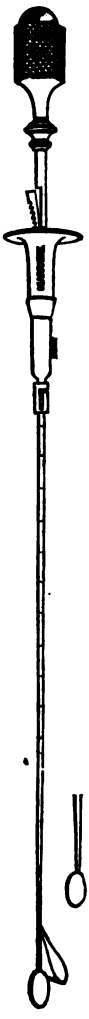
2. A stricture existing in any part of the anterior three or four inches of the urethra partakes, but in a somewhat less degree, of the intractable quality named, and may be cut with almost as much facility and safety as those in the previous class. As a rule, it may be said, the nearer a stricture is situated to the orifice of the urethra, the more necessary it is to cut, and the safer it is to do so.

3. Strictures in the bulbous portion of the urethra, which may be considered as generally ranging between four inches and five inches and a half from the external meatus, are less liable to be unmanageable by dilatation than those of the preceding classes. But when necessary to cut them, it is easy and quite safe to do so as a rule, slightly less so than those in the preceding class ; the difference being due, no doubt, to the larger amount of erectile tissue there as compared with the anterior part of the urethra. Bleeding, therefore, may be more considerable, and other risks, such as they are, more liable to be encountered.

Now, suppose for an instant that it were possible for you to have the stricture before you open to your eyes and hands ; you certainly would take a little scalpel and employ it for each case according to its needs, intelligently *dividing* the obstructing fibres as much as is necessary, and no more. But *with a very little* practice it is perfectly easy to do this without seeing the

stricture—that is, to apply a little scalpel, dividing where you wish and not elsewhere, just as you divide the constrciting fibres at the ring of a hernial sac. And I need scarcely say that this intelligent action of yours will produce something better than the work of a machine which any ignorant person can employ just as well as you. The difference in the two cases resembles that which exists between the music of an organ produced by a handle, and the music which results from the facile hand of a skilled performer.

It is a question of no mean importance which arises from the comparison of incision made by machinery and incision made by the intelligent hand. That is the real question in urethrotomy. And the instrument, which I always use, and have operated with so many times, is the type of the method which affords the opportunity of making the incision according to the operator's will and judgment. It is nothing more than a little knife with a long handle, and is used precisely as we use a scalpel anywhere else. Just as we should use a small knife in tenotomy without the sense of vision, where it is not necessary, but guided by the sense of touch, so do I advise you to cut in urethrotomy. I carry the parallel one step further, and remind you, that just as it is essential in tenotomy to divide completely the tendon, and also any little minor band of constricting tissue which opposes the perfectly free play of the joint, so is it essential to make the same complete division also in urethrotomy. The ultimate success in either operation depends on attention to these particulars.



The instrument to which I have been referring is the urethrotome of Civiale, made much smaller, as I prefer it to be, than is customary in Paris. The shaft of mine is about the size of No. 3 English scale, with an oblong bulb at the end not larger than No 5 or No 6. Within this is a little blade, which, by a clever contrivance, the operator can make to issue at will, as much or as little as he desires, and which he can also sheathe instantly at his pleasure. The bulbous end gives him the power of exploring the urethra at the time of the operation, and of determining precisely where and what he ought to divide. (*See Fig.*)

The bulb is to be introduced, say, fully half or three-quarters of an inch beyond the maximum point of narrowing felt, the blade is then to be projected there, and drawn steadily through the whole of the constricted portion outwards towards the meatus, in which direction the incision is sure to be certain and complete.

Now I at once anticipate an objection which I expect you all to raise. I expect you instantly to exclaim, "Why, if an instrument so large as No 6. can be passed through the stricture, should there be any occasion to cut at all? Surely it is for small strictures, through which only the finest instruments can be passed, that an operation is necessary, and for such this instrument of Civiale is obviously unfitted by its size?" Such criticism is quite natural at the first glance, and from those who have not learned by considerable experience certain important facts about confirmed stricture.

I reply, first, that the *narrowness* of a stricture alone, however extreme, does by no means render a cutting operation *always* necessary. Some of the narrowest strictures I have ever seen have been very successfully and rapidly treated by simple dilatation.

Secondly, the quality which makes incision of a stricture necessary is, as I have previously shown, "resiliency"—that property which leads it to contract again rapidly after any dilatation. This quality affects strictures which will admit No. 5, No. 6, or No. 7 quite as frequently as narrower contractions.

Thirdly, supposing it is necessary to cut a stricture which is narrow and only admits No. ½ or No. 1, there is *never any difficulty in dilating it temporarily* up to No. 6 for the purpose of admitting the instrument I recommend.

All you have to do is to keep the patient in his room from three to five days with a small soft gum catheter tied in, which produces scarcely any inconvenience; *and thus* by "continuous dilatation" you can always bring

the most resilient stricture to the required size for the operation. Having arrived at No. 6, you are enabled to perform the operation in the best possible circumstances. And the few quiet days spent in preparation are advantageous rather than otherwise; the result futhermore being that you can now make an incision in the manner I have described, directed by your intelligence, and adapted to the particular case.

For safety to the patient and excellence in result, both in regard of his present and future condition, I greatly prefer the operation I have described to any other method I have ever seen.—*Lancet, Jan.* 1, 1876, *p.* 1.

57.—ON SOME IMPORTANT POINTS IN CONNECTION WITH LITHOTRITY.

By Sir Henry Thompson, Bart.

[Modifications of practice have gradually taken place as the result of experience, which have removed most of the old objections to the operation of lithotrity. The success has greatly increased, and the after results much improved.]

1. The first principle I wish to inculcate in connection with the management of patients during lithotrity is, that it is desirable to treat any cystitis that may occur during the course of the sittings, especially if it is severe, by freely crushing the stone without delay. I have for some years insisted on the importance of this practice in my teaching. I believe that in this country its value has long been to some extent recognised; but the more I see of the operation, the stronger is my conviction of the great importance of this practice, and the more ready I am to adopt it. Abroad, cystitis is more generally treated by baths, diluents, low diet, and medicine; and the next sitting is postponed until the patient may be, as it is said, in better condition for the instrument. The surgeon fears the effect of introducing a lithotrite into the inflamed bladder, lest the disturbance should increase the inflammation—a result which it appears at first sight not unreasonable to expect. Now the precisely contrary effect is that which occurs. For example, I crush a uric-acid stone once; or it may be twice, with two or three days' interval between. In thirty-six or forty-eight hours after the sitting the pain and frequency of passing water become considerable, the urine is loaded with muco-purulent matter, and it assumes a full-red tint. Some slight febrile condition may or may not be apparent in the patient. Under these circumstances I place him under the influence of ether, crush freely all the large and sharp pieces, and wash out the débris with Mr. Clover's aspirator. Six hours after the urine is much clearer, the muco-pus has almost disappeared, and the patient's general condition is greatly improved. This will happen certainly in nine out of ten of the cases described. I have had the opportunity of demonstrating this to many of my foreign brethren, who are invariably struck with the result. The fact is that the cystitis in these cases is purely a traumatic one, that it is due to the injurious effects of the sharp, hard portions of stone which lie in continuous and close contact with the mucous lining of the bladder, the result of which is that incipient ulcerative action takes place. Crush and remove these, and that instant repair commences, inflammation is rapidly diminished, and the patient is no longer in danger, but is greatly relieved. Even simply changing the situation of the large pieces in the bladder is followed for a few hours by manifest improvement, showing in what manner their presence is injurious. If some large pieces still remain after the fresh crushing, the former symptoms of cystitis reappear in two or three days, and may be again relieved by another sitting, this time probably altogether or nearly so, as a *succeeding* crushing will, no doubt, dispose of the principal part of the *stone, and leave* at all events no considerable fragments. This practice has,

moreover, an important relation to the after-condition of the patient, as we shall see by and by.

On the other hand, let us suppose a case of lithotrity in which all goes well with the patient, and no fever, no cystitis, &c., happen; still the interval between the sittings should be short, not more than two or three days. You take advantage of the tranquil state of affairs to proceed steadily and carefully, not tempting fortune, but without a day's unnecessary delay. But if cystitis appears you are, as already advised, still less to lose time; and so in either event the operation of lithotrity is soon completed. I rarely exceed now fourteen or sixteen days as the full term which includes all the sittings. Often eight, ten, or twelve suffice.

This practice is no doubt facilitated by the recent improvements in anæsthesia. I have never been, as you know, very well disposed towards the employment of chloroform for any purpose when it could be dispensed with, but I have of late, mainly owing to the improved methods of producing anæsthesia, availed myself of it much more than formerly. I refer to the system which Mr. Clover always pursues, of administering first nitrous oxide for about thirty seconds, and then following with ether vapour. The rapidity and greater safety of the process as compared with that by chloroform, together with the freedom from subsequent sickness usually attained (the latter an advantage of no slight value), have influenced my practice, and I now make anæsthesia the rule and not the exception.* Consequently, also, I avail myself of the opportunity to do a larger amount of crushing than I did when the patient was conscious—a course which, while it is permissible or advantageous in practised hands, is not to be necessarily recommended to the young operator. To him, now as ever, I repeat that success can only be obtained by the greatest caution and prudence. He must not be tempted to introduce the lithotrite so frequently as he sees that I sometimes permit myself (especially in cases of cystitis requiring immediate relief) to do. I still advise you to be content with two, at the most three, introductions of the instrument at a sitting, and thus much only if you are able to make them with tolerable facility.

2. The second principle which is to guide your practice in lithotrity is the importance of detecting at all stages of the procedure any inability on the part of the patient to empty his bladder by his own efforts. Let me say at once that a very little negligence in relation to this matter is the chief cause, beyond all question, of the subsequent troubles which occasionally become evident at an early period after the stone has been removed, and which have constituted, in a certain proportion of cases in elderly men, sources of discredit to the crushing operation. In the cases referred to, the calculus is often removed easily enough, little or no trouble occurs during the procedure; but it becomes evident afterwards that the frequency of passing water is not remedied, and small pains and discomforts continue. The patient leaves his surgeon, and reappears in a few months or even weeks, with clouded, perhaps alkaline, urine, depositing triple phosphates, and with other symptoms more marked than when he left. My friend, Mr. Cadge, who has been reporting of late his valuable experience in relation to this matter, regards these phenomena as not unfrequently due to the escape of a small fragment into a sacculus in the bladder, where it becomes the source of irritation, phosphatic deposit, and occasions the formation of a fresh vesical calculus, with ceaseless discomfort and repetitions of crushing for the patient. I agree with him that this sometimes happens, having had, like him, ocular and other demonstration of the fact; but I have no hesitation in saying that in the large majority of cases this is not the cause, and that, happily, it is due to another cause, one that is in a very great degree preventable. These after-troubles will appear in patients who have had very little uneasiness antecedent to the operation. Their stones have been small, and their bladders have been in excellent condition; no ground, therefore, can exist for supposing

* Mr. Clover has employed this method, more or less, for me now about two years and a quarter, and for the last year and a half has done so without exception, using no chloroform whatever. In reply to my inquiry, he writes me that he has during this period administered the gas and ether for me two hundred and thirty times for lithotrity.

such a patient to be the subject of sacculus in the bladder. Every presumption, indeed, is opposed to that view, because sacculi, as a rule, do not form without the existence of an obstruction to the outflow of urine, which has been in operation for some long period of time.

Now the particular fact which I am going to state is one I was scarcely aware of five years ago. I have long been aware of the necessity of watching carefully for inability to empty the bladder during lithotrity, have long also spoken of the insidious manner in which that inability commences, and pointed out that it must be dealt with by the habitual use of the catheter. But I have only learned during the last few years how extremely small a quantity of urine habitually left behind in an elderly patient's bladder after each act of micturition, provided that he is undergoing, or has just undergone, lithotrity, suffices to lead to phosphatic deposit and to chronic cystitis. You will scarcely believe me that one drachm, or one drachm and a half, only of this residual urine is enough in most such cases to produce the condition so feared and detested by every lithotritist; and I now add, that if the condition is detected early, and this small quantity is promptly and frequently removed by the patient himself, which he can easily do with a soft *coudée* catheter, almost certainly the dreaded symptoms will not appear.

I have been surprised at the result; not less surprised than I have been at the fact that the patient, who towards the close of lithotrity, or afterwards, is making urine every hour or so, and who, on passing his catheter, finds only one or two drachms behind, often obtains at once an interval of three hours or more. Such a one should pass his instrument at least three times a day until he regains the power to empty the bladder completely by his own efforts. I confess that formerly so small a quantity of urine did not seem to me worth the trouble of removing; as I assumed, on theoretical grounds of course, that it could not be of any importance. I now know that the practice of removing it constitutes for many cases the difference between a permanent success and an ineffectual result and painful future.

Now then, how does the plan of crushing for cystitis, referred to under the preceding head, affect, as I said it would, also this important question which we are now discussing? Thus: it is precisely in those cases where the treatment has been prolonged, or where cystitis, either acute or chronic, has been allowed to go on unchecked, that the inability to empty the bladder is most likely to occur. Again, this inability, once commenced, very rapidly becomes the established order of things in elderly people, unless it is checked at the outset. Once let the bladder be accustomed to the smallest degree of accumulation of urine, and the power to empty itself entirely is, after a certain age, often permanently lost. The best chance of preventing this, and the phosphatic deposit which results, is, in the first instance, to avoid or cut short cystitis during the treatment by lithotrity in the manner described; and, secondly, to teach the patient to empty his bladder himself towards the close of the operative proceedings or immediately after, if the smallest failure to empty it is detected. Once for all, let me say, I cannot exaggerate the importance of these recommendations.

Now, when this tendency to produce phosphatic deposit has been unfortunately established, we are often able to benefit the patient by teaching him to wash out the bladder, by means of an ordinary catheter and bottle, with weak acetate of lead, nitric acid, &c. But of late I have adopted another method, with manifest advantage. I advise the patient (who may or may not be habitually using the catheter to empty his bladder) to use every second or third day the following apparatus:—

(1) A black flexible catheter, No. 11 or No. 12 in size, made thin, and with polished interior, so as to facilitate the passage of débris through it (a great improvement on the ordinary French flexible catheters, which are thick and have often rough interiors), and having a large oval eye on the upper surface of its extremity, which is slightly turned upwards (*coudée*).

(2) An eight-ounce india-rubber bottle, with a brass nozzle which fits *over* the outer end of the catheter, and not into it. The manifest result of this *mode of attachment* is, that a powerful uninterrupted current can enter and *issue from* the bladder; indeed it is scarcely possible that debris should re-

main in the organ under the influence of the action of this apparatus, as any one can perceive on using it. It may also be used as an aspirator, with a backward and forward current, if desired. For the patient's own use it is even more easy than the ordinary four-ounce bottle, which I have long been in the habit of desiring such to apply, since the size and freedom of the channel—not narrowed at the point of contact between bottle and catheter—permit the fluid to be propelled with very slight pressure.

There is still one admirable remedy for that low chronic cystitis which is associated with the production of phosphatic calculus in the bladder—viz., the injection, every day or every other day, for a short time only, of a very weak solution of nitrate of silver. About half a grain to four or six ounces of distilled water is amply strong enough; and one or two injections sometimes suffice, in these circumstances, to produce a very notable diminution of the muco-purulent secretion. —*Lancet, Jan.* 8, 1876, *p.* 39.

58.—ON THE RETENTION OF BOUGIES INSTEAD OF CATHETERS FOR THE CONTINUOUS DILATATION OF STRICTURES.

By FURNEAUX JORDAN, Esq., Surgeon to the Queen's Hospital, Birmingham.

Among the various methods of treating stricture of the urethra, that of continuous dilatation is justly held in much esteem. In a few days, and with no risk, a very tight stricture may be dilated so as to permit a large instrument to be passed; hence the treatment may be said to combine the safety of gradual dilatation with the rapidity of incision or rupture. It is not suited to every case. It will not, for example, take the place of internal division in strictures anterior to the scrotum, nor of external division in persistent fistulæ. In a large number of tight—perhaps very tight—old and neglected strictures, with no great irritability or resiliency or attendant induration, the surgeon is glad to get in a fine instrument and leave it in.

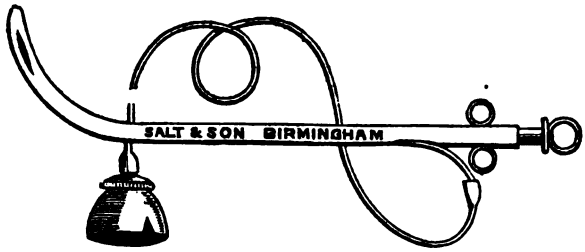
Although it may require much patience and skill to introduce the finest bougie, the general custom is to withdraw it and attempt the introduction of a catheter. The effort occasionally fails, and much valuable time is lost. Now, in such cases I have for several years *kept in the fine or filiform bougie, and directed that the urine should be passed from time to time by its side or around it.* In every instance in a large number of cases this has been easily done, micturition, as a rule, actually being easier and in a larger stream than when the bougie is out. In twenty-four hours a goodly-sized bougie (not catheter) can be introduced. On the third day I usually put in a No. 12 or even No. 13 bougie or catheter. It is of course in the earliest stages that the superiority of the bougie over the catheter is seen.

The advantages of the treatment I have just described are these:—A more rapid and complete dilatation, due to the hydrostatic pressure of the urine along the exterior of the bougie; a bougie is more easily introduced than a catheter; when the finest bougie is once in, it need not be taken out—no slight boon; the ordinary acts of micturition are preserved; every kind of apparatus for keeping the bed dry, or for any other purpose may be dispensed with.—*Lancet, Jan.* 29, 1876, *p.* 169.

59.—IMPROVED CATHETER FOR BED-RIDDEN PATIENTS.

Messrs. SALT & SON, Surgical Instrument Manufacturers, Birmingham, write to us :—"In a paragraph which appeared in the British Medical Journal, January 1st, 1876, you mention a suggestion of Dr. George for rendering a catheter more convenient for use with bed-ridden patients, by the attach-

ment of a piece of india-rubber tube connecting the catheter with the *pôt de chambre*. The engraving above will show the plan we recently devised for



accomplishing this purpose. To an ordinary catheter we attach a curved tube, on the end of which the india-rubber tube is slipped, having at its other end a small weight to prevent the tube from leaving the vessel. The distal end is made to act as a syphon ; the flow only takes place when the sliding tube is drawn out about half an inch. By this arrangement, the bed-clothes and the surgeon's hands are protected from the fluid."—*Brit. Med. Journal, Jan.* 8, 1876.

60.—ON PUNCTURE OF THE BLADDER *PER RECTUM.*

By Richard Davy, Esq., Surgeon and Lecturer on Anatomy at the Westminster Hospital.

[There is scarcely any operation so devoid of danger as puncture *per rectum*. The instruments usually used are a solid trocar and cylindrical canula, the latter being retained in the bladder by tapes.]

In 1870, being impressed with the disadvantages of retaining for any length of time an unyielding tube *per rectum et vesicam*, I introduced the instrument (Fig. 1), in which the steel slotted cylinder is outside, and acts as a perfor-

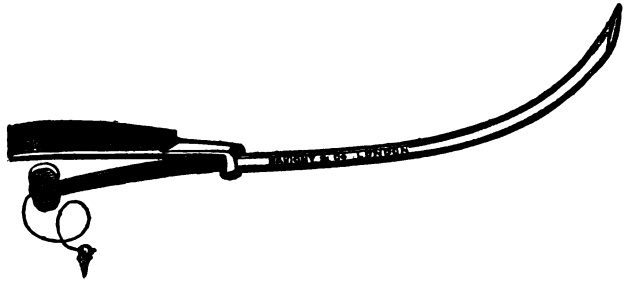


Fig. 1

ator, carrying the elastic catheter as an inside passenger. Fig. 2 shows the catheter withdrawn, also the reduplication of the tip of the catheter, by means of which it is retained in the bladder. The patient is placed after the operation on a mattress having a circular hole corresponding to the buttocks; the end of the catheter falls through this hole, and conducts the urine into a receiving vessel on the floor below. Fæces also are thus passed without moving the patient.

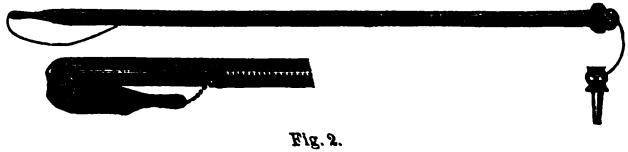


Fig. 2.

I have yet further applied this principle of giving the urethra rest to those cases of obstinate perineal fistulæ that are *not dependent* upon an obstructed urethra for their persistence. I am of opinion that a simple operation like puncture *per rectum* is more effectual and easy than periodic introductions of a catheter ; the object being in both cases to avert the irritating urine from the damaged urethra and fistulæ, especially so because in some cases men have not the power of retaining their urine; and it is impossible by the most skilful catheterisation to avoid some disturbance to the urethra, and some extravasation of urine over the exposed surface of it and the fistulæ

I have been in the habit of comparing the *rationale* of puncture *per rectum* in fistulous cases to the method pursued by workmen when repairing the damaged banks of a running stream. Their first object is to completely divert the stream from the seat of their repairs, so that one day's wash shall not outweigh one day's work; and this argument applies with double pathological force to the irritating urine as compared with the pure water. But a moment's reflection makes a surgeon see how inapplicable Cock's method would be for opening an empty bladder; and, at the risk of the charge of superfluity, I venture to bring you acquainted with a new instrument, and a new method of operating on this much operated on human perinæum. The instrument consists of a staff, on which slides a silver cylinder, and a removable handle. (Fig. 3.) The silver tube runs from the bulge at the right end of the staff to the commencement of the curve on the left. The thin stem underneath the handle is for the attachment of a retentive catheter.

Fig. 3.

New Method of Operating.—First introduce the staff into the bladder; turn the tip of the staff towards the base of the bladder and rectum; feel for the point with the finger in the rectum, and carefully cut the recto-vesical tissues until you can pass the staff out at the anus. Next unscrew the handle and affix the stem of one of Napier's retentive catheters to the thin end of the staff ; soap well the india-rubber; then, holding the silver tube firmly in one hand, draw the catheter (excepting its bell-shaped end) completely into the silver tube by withdrawing the staff at the anus. Lastly, draw back the silver tube and catheter through the urethra into the bladder; push in the catheter, and free the silver tube by also withdrawing it through the rectum out at the anus. The campanulate end of the catheter unfolds itself in the bladder, and its stem loosely hangs at the anus.—*Brit. Med. Journal, Dec.* 4, 1875, *p.* 697.

61.—ON THE TREATMENT OF ACUTE ORCHITIS BY PUNCTURE OF THE TESTIS.

By Henry Smith, Esq., Surgeon to King's College Hospital.

[Since the year 1864, when Mr. Smith brought his plan of treating acute orchitis before the profession, he has performed the operation in more than one thousand cases. Hundreds of Mr. Smith's pupils at King's College Hospital have witnessed this treatment, and thus the results have been pretty satisfactorily ascertained. It consists in puncturing the body of the inflamed organ by a single incision extending in depth to half or three-quarters of an inch.]

It is only in cases of the most acute form of the disease that I recommend this treatment, and in by far the majority of these instances I have found that the relief given to the pain in the testicle itself is very marked, and almost instantaneous; in fact, so much so that patients who come to the hos-

pital in severe agony are enabled to walk out of the building comparatively free from pain, and in many instances joking about the treatment to which they have been subjected. I have had patients return to me for similar treatment to the other testis, after undergoing the operation on the one at some previous time, and than this there can be no better proof of their estimation of the relief which is produced by the puncture.

When questioned by pupils as to the *modus operandi* of the remedy, I have answered that the sudden relief from acute pain is due to the circumtance that the unyielding tunica albuginea is freely incised, and that the tension is thus taken off the compressed and swollen testis; in some instances there is more or less serum effused into the cavity of the tunica vaginalis, and the withdrawal of this greatly assists in giving relief, but in many instances there is hardly any effusion of serum. In most cases undoubtedly the loss of blood produced is an important factor in the rapid subsidence of pain, but in some cases so little bleeding is produced that the relief cannot be explained in this way. Vidal de Cassis explained the sudden relief by the compression being taken off the testis through division of the tunica albuginea. In the old-fashioned treatment which I was taught to adopt, large quantities of leeches and nauseating doses of antimony were the chief ingredients; yet nothing like the speedy and effectual relief from puncture was produced, and every now and then a violent attack of erysipelas would be brought about by the leeches. As a general rule the puncture is productive of so much relief to pain that no other treatment is required, except to support the part, and occasionally to use compression by strapping—a means well calculated to diminish the swelling, which is scarcely at all reduced by the puncture, and the persistence of which annoys the patient.

I have seen none of the bad results from puncture as have been pourtrayed by the fertile imaginations of alarmists, who were haunted in their dreams by visions of hernia testis, atrophy of the organ, and emasculation. I had once a case of slight protrusion of the "tubuli seminiferi," well known to my pupils; but this occurred in a young strumous man who, on the day following the operation, received a severe blow on the scrotum.

I have not met with a case of atrophy of the testis, but I have seen two cases in private practice, in young healthy persons, where the testis was quite destroyed from the violent inflammation of the organ, and where the good old-fashioned plan of leeches, &c., was used; in all probability puncturing the testis in these cases would, by relieving the inflammation, have prevented the destruction of the organ.—*Lancet, Jan.* 8, 1876, *p.* 43.

62.—PUNCTURE OF THE TESTIS IN ACUTE ORCHITIS.

By T. W. Nunn, Esq., Surgeon to the Middlesex Hospital.

A case of acute orchitis occurred in my practice at the Middlesex Hospital, in which I had failed to relieve the patient of the intense pain he was suffering. The testicle was not greatly swollen, but it was very hard ; and the scrotum, which was thin, was unusually ruddy. I punctured the testicle, at two or three points on its anterior and outer aspect, with a bistoury one-tenth of an inch wide, to the depth of about four-tenths of an inch. The pain almost immediately began to subside, and convalescence commenced. I punctured the testicle, acting on the same principle that I should perform iridectomy in acute glaucoma, and I assume it is on this principle that Mr. Smith bases his treatment. Those who have watched the progress of ophthalmic surgery during the past five-and-twenty years will remember the prejudice that existed against iridectomy—a prejudice that has yielded to extended experience, but a prejudice which doubtless beneficially acted in *controlling* the proceedings of the mere imitators of the operations of truly *scientific* surgeons; I therefore venture to hope that this question of puncture

of the testis in acute orchitis will receive calm and fair consideration. In my humble judgment it is a question that involves important surgical principles, and is not to be settled either by ridicule on the one hand, or by limited personal experience on the other.—*Lancet, March* 25, 1876, *p.* 479.

63—ON THE TREATMENT OF INCIPIENT STRICTURE BY OTIS'S OPERATION.

By Berkeley Hill, Esq., Professor of Clinical Surgery in University College.

[What is known as "gleet" is produced by affections of very different nature and in different parts of the urethra, and requires very-different kinds of treatment for their cure.]

Last July Dr. Fessenden N. Otis, a distinguished surgeon of New York, demonstrated in our operating theatre his mode of curing gleets and stricture of the urethra, in a lecture remarkable for its clearness and for the skill with which his manipulations were performed. In that exposition Dr. Otis enunciated views which vary considerably from, and indeed are opposite to, the doctrines usually taught in this country. I propose to-day to examine what we were told on that occasion with the light that some experience we have been able to gain in our own hospital has thrown upon it. In doing this I would not have you suppose that there was little to be learned from our American *confrère;* on the contrary, I am satisfied that much of what he told us is perfectly true, and a real contribution to our knowledge of urethral affections.

The chief points of Dr. Otis's demonstrations were:—

1. The human urethra varies much in its caiibre in different persons. Hence an instrument that is a full size for one man may be either much too great or too small for another.
2. The urethra is really much wider than is generally taught.
3. The meatus urinarius is normally as wide as the rest of the canal.
4. Gleet is always due to stricture. It is "the signal that nature hangs out to call attention to the fact that stricture exists somewhere."
5. In the term stricture Dr. Otis includes those early indurations which have not sufficiently advanced to interfere with the passage of urine or to produce any sympton beyond a discharge. But he maintains them to be really bands of contractile tissue-fibres produced by inflammatory action.
6. Stricture is most frequent in the first inch from the meatus, and is less frequent as the distance from the entry increases.
7. Complete division of a stricture and maintenance of the incised part at its natural width until the incision is thoroughly healed prevents return of the contraction, and, moreover, *causes absorption of the indurated tissue from the affected part.*

I propose to examine these novelties one by one.

That the urethra should vary in calibre in different persons, considering that the penis also varies greatly, might well be presumed *à priori;* and Dr. Otis has most satisfactorily demonstrated that it does so. But I trust you have not forgotten the description of the urethra given by Sir Henry Thompson in his lectures before Christmas. He there showed how the urethra is not a tube at all except while some body is passing along it, and defined it to be a *closed valvular chink*, capable of distension to a different amount in different parts of its length. It will be well to bear this in mind, and also that for our purpose to-day we are concerned only with the *spongy portion* of the urethra.

Books on anatomy tell us that the bulbous portion is somewhat wider than the rest, having a circumference of seven-tenths of an inch, and that the remaining part is one or two tenths less in circumference; further, that the meatus does not exceed one quarter of an inch in width. These measurements are doubtless taken from the dead body, and if we conclude that they

represent the dimensions of the living urethra, we shall be in error. The practical importance of ascertaining what is the usual extent to which the "valvular chink" is dilated during micturition is this: diminution of capacity in the urethra means impediment to the flow of urine from the bladder. If the balance between the natural expulsive force of the bladder and the friction of the stream along the urethra is disturbed, the bladder is irritated, the kidneys are affected, and the beginning of the long chain of events, which terminate not infrequently in death, is made. To know if a man has stricture, we must first know what the natural distensile power of his urethra is, and to ascertain this, Dr. Otis discarded any arbitrary standard, which, you know, is usually set at about No. 12 of the English scale, but measures each urethra before he proceeds to operate upon it. For this purpose he has invented a most ingenious instrument which he calls the "urethrometer." It consists of a slender cannula marked in inches, at the end of which a set of steel springs can be expanded into a bulb by advancing a stem within the cannula. This movement is obtained by turning a screw at the handle, and the amount of expansion is recorded by an index on a dial-plate. When screwed close the instrument is not larger than a No. 6 English sound—that is, a circumference of less than half an inch. It can be expanded to a maximum circumference of an inch and three-quarters—two and a half times the seven-tenths of an inch which your anatomical guides tell you is the circumference of the widest part of the spongy portion. To measure the urethra the expanding sound, covered by a thin india-rubber sheath, is introduced in its contracted form as far as the bulb, between five and six inches. It is then screwed up until the patient announces he has a sense of fulness, but not so tightly that the instrument cannot be moved without being grasped by the passage. This gives the size of the canal at the bulbous part. The urethrometer is gently withdrawn, the expanding part being enlarged or diminished as tight places or slack ones are passed, and the several dimensions are noted by observing the index, and the distance of the expanding part from the meatus. Any diminution from the widest measurement Dr. Otis holds to be a stricture and abnormal. For the further examination of these contracted areas, Dr. Otis employs a series of bulbous sounds ranging from about No. 4 English catheter to one much greater than any size in our scale. But before describing them I must remind you that Dr. Otis, like nearly all who work at urethral affections, has discarded the English scale, one entirely arbitrary, ascending from the smaller to the higher numbers by wide grades of unequal length. He chooses the French scale, which is perfectly scientific. It takes the millimetre for its unit, and the number of the instrument denotes its circumference in millimetres. Thus No. 1 French is one millimetre in circumference; No. 20 twenty millimetres; and so on. Compared with these, No. 1 English is equal to No. 3 French, and No. 11 English to No. 20 French. Here is a gauge Mayer and Meltzer have made for me, with forty sizes cut in the plate. The plate is marked on one side with the French numerals, and also graduated with a decimetre divided into centimetres and millimetres. On the other side, the English numerals are marked opposite their respective sizes, and there is also a scale of six inches, divided into sixteenths of an inch. Thus the catheter-gauge forms a ready means for comparing French with English measures. Dr. Otis's series of bulbous sounds are spread out before you. They have a slender stem of about four millimetres screwed into the wider end of a bulb or bullet. The best shape for the bulb is that of a turkey's egg, which you know is a little more pointed at the small end than the egg of a common hen. The bulbs range in size from No. 8 to No. 40. Their number corresponds to the big end.

With these instruments Dr. Otis has measured over 500 urethræ, from which he tells us that the expanding capacity of the urethra bears a constant ratio to the circumference of the penis below the glans. Hence if you measure the outside of the penis you can foretell the size of the urethra. Further, that the average size is between thirty-one and thirty-two millimetres, or an inch and a quarter—that is, more than half as large again as the measurement *hitherto* accepted. From these observations also Dr. Otis finds that the meatus, when not congenitally narrowed or contracted by balanitis in boyhood,

a frequent occurrence, is as wide as the rest of the urethra. I have not measured a number of urethræ approaching to 500, but I will give you the results of my measurements so far as they go. Since last spring I have measured ninety-five urethræ (all of them in subjects of urinary disease by the way), and in only three did I find the meatus as wide as the rest of the canal. One of the three exceptions was that of a man who never had gonorrhœa, but an exceedingly narrow traumatic stricture of the bulbo-membranous part. In him No. 32 sound slid easily down to the stricture by its own weight. This would show that the meatus may be either normally narrower than the rest of the canal, or that morbid contraction is exceedingly common. Be that as it may, practically we have generally to deal with a narrow meatus, the average size being twenty-two millimetres. The measurement of these ninety-five urethræ has satisfied me that we have underestimated the size of the urethra, and that Dr. Otis is correct in claiming large calibres for that canal. But I have not found the bore, so to speak—the capacity for distension, in more accurate diction—to be uniform from the bulb to the meatus. At the bulbous part the urethra is widest, and remains of even width for about two inches. It then narrows gradually, and for the rest of the passage is about three millimetres less, being most narrow at the outlet. This is, as you well know, in agreement with the description of anatomists, only that the distensile capacity of the urethra measured in the living body was greater than the limits they set down. Thus the spongy urethra is conical in shape, resembling the tapering nozzle of a syringe. Whether this be a provision of nature to make the escaping stream more forcible I know not, but you will recollect that the special *raison d'être* of this part of the urethra is to conduct, not the urine, but the semen. Of this I am persuaded, that the less calibre of the urethra at this point is natural, and not the result of chronic inflammation, so long as it is gradual and not abrupt. Morbid narrowings are easily perceived by the sudden way in which they obstruct the bullet, and by the suddenness with which it is released when they are passed.

Next, with regard to the invariable presence of a non-dilatable area of the urethra, a band of contracting fibres—that is, a stricture of more or less development, in every case of gleet. I repeat that I still think that stricture in any shape is not the sole cause of gleet, though doubtless this is the most frequent condition in such cases.

With respect to stricture being most frequent in the first inch and a quarter of the urethra, out of 258 strictures, Dr. Otis found 115 within that distance of the meatus, and the remainder in decreasing frequency in each succeeding inch. This, you know, is contrary to the received doctrine, which places stricture most frequently at the bulbo-membranous part. My experience does not support Dr. Otis's statement. In 1870 I recorded 63 strictures, examined with bulbous sounds, at the Male Lock Hospital in 1869, when I found them 43 times between four inches and a half and six inches—a position, allowing for variation in length of the passages in different persons, almost the same in all.

Next, having ascertained the presence of some unnatural narrowing of the spongy urethra, does internal division cure it, and prevent its return or further development, and consequently cure the gleet? If we adopt Dr. Otis's teaching our course is simple. A patient applies for cure of a gleet. His gleet must be the consequence of stricture. Find that stricture; cut completely through it to the erectile tissue, so as to make the urethra a little wider than before, and take care to maintain this artificial patency while the incision is healing; the cure is then complete and permanent. This is the result of operating in a large number of cases, a report of which has been published in several forms. In 100 published cases, 31 patients were found without recontraction when examined at a considerable period after operation; 52 others were not examined, but reported themselves well; the remaining 17 were not quite cured, though relieved. Such evidence induced me to give a trial to this method. I may state that all the cases operated on here were those of long-standing gleets with contraction in one or more parts of the spongy urethra, and had undergone multifarious treatment. The number of patients is 16; 15 of my own and one of Dr. Otis's—the

case on which he operated in our theatre on the 6th of July last. In five cases the gleet stopped after the operation, and the patient was at the last report—taken in none less than three weeks, in most some months, after the operation—able to pass a bougie of the estimated size of the urethra. In short, they may be claimed as cures. But of these five the operation was serious to two; one had free bleeding for three days, the other three attacks of rigors. Of the remaining eleven, among whom Dr. Otis's own operation must be included, the gleet persisted in all; in several the urethra shrank again to its size before the operation, and in some very serious complications ensued. In four bleeding lasted several days, and in one was even alarming. Three patients had rigors; in two the shivering was unimportant, being that which follows the first transit of urine along the incised urethra in certain individuals, but is not repeated or attended by further consequences. In the third patient the rigors preceded abscess in the buttock. One patient had orchitis. Thus in seven the operation might fairly be termed a trifle, causing no pain or any after-fever; but in five only was the operation successful. It may be contended that want of practice on my part, or imperfect performance of the operation, were the causes of this small success. But I am protected against this danger by having had the benefit of Dr. Otis's personal instructions, and by the fact that one of the least successful cases was that in which Dr. Otis operated himself. The man was in sound health with the exception of his gleet and contraction of the urethra at two and a half inches from the orifice. He made light of the operation, submitting most patiently to the somewhat prolonged manipulations; being animated by the patriotic resolve, as he afterwards told us, that "No Yankee should make *him* flinch." The patient bled copiously after the operation; the hemorrhage not stopping altogether for six days. No other complication ensued, the man was able to get up as soon as the bleeding had stopped, and would have left the hospital at once if permitted. However, though he remained some weeks longer with us, and afterwards attended assiduously for the regular passage of the sound, his gleet persisted till Christmas, and was at last cured by other means. There still remains a scar or induration in the erectile tissue, which gives a crook to the organ during erection. Whether the division of the contracting band caused permanent absorption thereof in any of these patients I do not know, but have very little expectation that it did so. Certainly it failed of this effect in almost all.

When telling you, as those who frequent my wards already know, that I have abandoned this operation for curing gleets accompanying slight contraction of the urethra, I should not omit to tell you that in one point I have varied from Dr. Otis's operation. His urethrotome, which I hold in my hand, is used as sollows :—The instrument is passed along the urethra until the end is well beyond the stricture. The instrument is then dilated until it stretches the urethra to its full capacity, or, to make sure, to one or two millimetres beyond that capacity. Next a small cutting edge, previously concealed, at the end of the dilating part, is drawn along the tightly-stretched tissue to the meatus. This long furrow is made in the mesial line in the roof of the urethra. Disliking this long cut, which divides uncontracted parts, as well as the strictured parts, I have employed, except in one case, a stricture incisor, which, while it stretches the urethra to the size previously determined, cuts only where it is strictured. Its mode of action I shall explain when speaking of the division of narrow strictures. As the contracted areas are as freely divided by this plan of cutting, I cannot fairly charge it with the numerous failures that have attended Otis's plan of treating wide strictures.

The plan of treating these affections to which I have returned is that which I adopted before—namely, the repeated passage of bougies, large enough to distend the stricture, but not large enough to be tightly grasped. The size of the bougie is increased at each visit—that is, about twice a week—to keep pace with the increasing expansion of the urethra until the capacity of the uncontracted parts is reached, when the same size is continued by the *patient* himself for several weeks longer. When the meatus is greatly *smaller* than the rest of the passage, I cut it either by Otis's meatome, this

straight probe-pointed bistoury, or by a bistouri câché, to which Coxeter has added a second shield, which can be separated from the first by a screw-pin, and so make the fibres tight before they are divided. The incision is made in the floor, and must be pretty complete, as the little ring of fibres is very tough, and often needs two or three applications of the knife to divide it fairly.

But do not misunderstand me. I do not mean that every gleet requires instrumentation forthwith as a matter of course; on the contrary, avoid the use of instruments whenever you have satisfactory evidence that the discharge is not of long standing. The exact length of time that indicates stricture is uncertain, for the inflammatory induration constituting stricture is formed very slowly in some persons, but comparatively fast in others. As a general rule, don't search the canal when the discharge has lasted only six months or less. Be sure, however, that the whole duration of the discharge is really contained in six months, and that there have not been previously periods of clap or gleet to which the present discharge is only a successor. Several relapses of gleet are very strong evidence of stricture. Bear constantly in mind that the introduction of an instrument of any kind into the urethra is an evil, and though in time the canal gets accustomed to the foreign body, this, like many other faculties, is not acquired without discomfort or pain. Resort to instrumentation only when you are satisfied there is legitimate cause for it. Nevertheless, when you do employ instruments to search for stricture, use such as are adapted to the end in view.—*Lancet, April* 8, 1876, *p.* 522.

64.—ON THE EXTENSION OF INFLAMMATION FROM THE EPIDIDYMIS TO THE URETHRA.

By Furneaux Jordan, Esq., Professor of Surgery to Queen's College, and Surgeon to the Queen's Hospital, Birmingham.

I have had many opportunities of showing cases of epididymitis following urethral disease. The disease is a common one, and its causes are many—almost too many to count. It would be easy to run over some half a hundred, and yet leave a few unmentioned. Urethral disease following and resulting from inflammation of the epididymis is, on the other hand, rare; it has few causes, and is not yet at all recognised.

I show you here a case of urethral discharge, which followed traumatic inflammation of the epididymis. This young man was in good general and genital health. He had never had gonorrhœa. His urethra, meatus, and prepuce were perfectly healthy when he came into the hospital. He received a violent kick on the left testis, and came in two days afterwards with some ecchymosis in the scrotum, and severe pain, tenderness, and swelling, which were clearly seated in the epididymis. On admission, the cord was not thick, nor tender, nor painful. The day after admission, I myself found part of the cord greatly thickened—the thickened portion running up from the testis, and gradually subsiding just below the outer inguinal ring. The second day after admission, the swelling of the cord had passed into the canal, which was now full and tender. Two days later a urethral discharge, neither abundant nor scanty, and whiter than ordinary gonorrhœal fluid, made its appearance, and with it micturition became a little painful and a little more frequent. This is the first case I have been able to show you, and I have myself seen very few.

Recently I saw a case of epididymitis, also from injury, of much interest, and having a direct bearing on our subject. A gentleman, aged fifty, in fair health, came, in the dark, with his right testicle against a key in a door. Scrotal ecchymosis and considerable epididymitis followed. The cord became much enlarged, running like a rope up into the inguinal canal. Later, an abscess formed and broke at the front of the scrotum. Now, in this case, from first to last there was no urethral discharge. There was undoubtedly

inflammation of the epididymis, and as undoubtedly the inflammation ran up the cord—probably to the urethra.

The question naturally suggests itself, albeit parenthetically, Why does inflammation of the mucous surface yield a muco-purulent discharge in one case and not in another? Why, in one case of inflammation of the bladder or bronchial tubes, is there abundant pus and mucus, and in another case little or none? I reply, We do not know. You frequently hear me use the expression "We do not know." I think it better to say plainly we do not know than to cover our ignorance with sounding phrases. It may seem paradoxical to you, perhaps, but I often silently contemplate the benefits of a negative system of surgery—if we could get it: I mean a systematic review of what we do *not* know. The author would be a man of no ordinary courage; he ought to be a man of learning, experience, and judgment equal to his courage.

The case I have just told you proves the conclusion I wish to bring before you—namely, that inflammation may run upwards fom the epididymis—more forcibly, in one respect, than if a discharge had followed. You are aware that at the height of a consecutive epididymitis the urethral discharge often disappears, only to return a little later; but here it was clear we had no hypocrite trying to hide a clap, because there was at no time any clap to hide.

Touching the question of suppuration, I find, with surprise, that so careful an observer as Van Buren denies its occurrence in epididymitis. If there be an abscess, he infers that the body of the testis is inflamed. I believe that in this country surgeons are agreed that suppuration is not rare in the consecutive or other epididymitis of cachectic men.

Let me ask you now to look for a few moments at the causes of inflammation of the epididymis and cord. Bear in mind that any inflammation of the prostatic urethra may extend along the cord to the epididymis. Now, an inflammation of the bladder of any kind, whatever its cause, under whatever circumstances it arises, may run forwards to the prostatic urethra, and thence to the epididymis. Again an inflammation of the anterior urethra of any kind, however caused, arising under whatever circumstances, may run backwards to the prostatic urethra, and thence to the epididymis. Acute inflammation arising primarily in the epididymis has few causes: I can speak positively of one only—injury. If the causes of primary epididymitis were more numerous, we should, I think, long ago have held urethral disease to be one of its results. Why injury sets up epididymitis mostly, and not orchitis, is no doubt for the same reason that inflammation of the cord and epididymis so rarely reaches the testis—namely, that within the tunica albuginea there is no room for acute inflammation, for vascular changes, cell-proliferation, migration of cells, the running riot of germinal matter, or other inflammatory phenomena.

If you accept the facts of the case before you, and my reading of them, you will now and then be able to explain an otherwise obscure gleet. Moreover, you will not be compelled to affirm that in every case an epididymitis and a gleet together have necessarily a urethral, much less a sexual, origin. The views now before you may occasionally have (I speak from personal observation) other important or domestic legal bearings.

The treatment I adopt here is that which I am in the habit of adopting in inflammations; but which, seeing that it is exceptional, and strange to examining boards, I rarely take up your time in explaining. My creed is brief: I believe that the inflammatory process is much the same everywhere. I believe that the best remedies in one inflammation are the best in all. I believe that the best remedies are removal of cause (where it is removable), rest, adjacent and not too near counter-irritation, suitable pressure, elevation, and a few simpler matters. I therefore in each case try to find out the best way of using these remedies. In acute epididymitis I enjoin counter-irritation lightly over the scrotum, sharply in the groin and front of thigh; pressure, which begins as a delicate support, and goes on to actual compression, rest and elevation, as far as they are practicable. The value of compression is *well seen in the* circumstance to which I drew your attention a moment ago —*namely, the* pressure kept up on the testis. If our bodies were mapped

out into small areas, and each area were bounded by a firm capsule like the tunica albuginea, we should be free from the dangers of at least acute inflammation.—*Medical Times and Gazette, March* 4, 1876, *p.* 246.

65.—ON THE TREATMENT OF VESICAL IRRITABILITY AND INCONTINENCE OF URINE IN THE FEMALE BY DILATATION OF THE NECK OF THE BLADDER.

By T. Pridgin Teale, Esq., M.A., Surgeon to the General Infirmary at Leeds.

[Mr. Teale has been making observations upon the subject of this essay for a period of eight years.]

About eight years ago the following case, of which unfortunately I cannot find any record, was under my care at the Leeds Infirmary:—A healthy-looking middle-aged woman had been for some time under treatment for great irritation of the bladder, accompanied with the passage of mucus tinged with blood. Having failed to relieve her by the usual means, I decided to dilate the urethra in order that I might introduce the forefinger into the bladder, and search for same explanation of the pain and bloody discharge, such as an ulcer or villous growth. No definite lesion was discovered; but, to my surprise, in the course of a few days, I found that she was completely relieved. She left the hospital, and I have not heard of her since.

This case struck me forcibly as parallel with the immediate relief which generally follows forcible dilatation of the anus for fissure and spasm of the sphincter; and I determined to profit by the hint. The result is, that during the last eight years the operation of dilating the neck of the female bladder as a means of cure of a distressing and unmanageable malady has been adopted in thirty or forty cases by myself and my friends.

The *cases* calling for the operation are those in which there has existed for some months pain at the neck of the bladder and too great a frequency of micturition, with or without pus, mucus, or blood in the urine; or incontinence of urine, with a full bladder unable to empty itself completely, or with a nearly empty bladder which is intolerant of the presence of urine. The *time* for doing the operation is when all ordinary means of relief have been tried in vain, whether general or specially directed to the bladder, uterus, rectum, or kidney.

This definition may be said to embrace a very wide range of disorders, having in common the one symptom—irritability of the neck of the bladder. The fact is, the operation has been tried and has succeeded in a great variety of cases. In some successful ones there have been pain and excessive frequency of micturition, giving rise to a suspicion of stone in the bladder, with urine perfectly healthy, and in which, at the time of the operation, the finger failed to detect any fault in the mucous lining of the bladder. In other cases the urine has contained altered pus and mucus and blood, such as is usual where there is vesical calculus, and yet the operation has cured. In others, again, there has been an abundance of unaltered pus, settling in large quantities to the bottom of the vessel, which was afterwards proved to have been derived from a suppurating kidney or other extravesical source; and even in these the operation has given substantial though perhaps temporary relief. More than one case has proved this fact—*that pus from a source external to the bladder may give rise to distressing irritability of the bladder, with pain and excessive frequency of micturition, the bladder itself being apparently sound;* and that the vesical irritability may be cured—for a time, at any rate—by dilatation of the neck of the bladder, although the original cause of the irritability remains in force.

Vesical incontinence.—In two cases (Mr. Scattergood's and Mr. Horsfall's) a perfect cure, and in one of my own cases very great mitigation, of vesical-incontinence has resulted from dilatation. In these cases I suspect that there is an over-*sensitive* state of the mucous membrane at the neck of the

bladder, which, the moment an attempt is made to empty the bladder, sets up spasm of the vesical sphincter, and arrests the act of micturition after the escape of a very small quantity of urine, the bladder remaining nearly full and ready in a very few minutes to induce another painful and equally ineffectual attempt at micturition. Thus an overflow of a bladder disabled from correct micturition by irritability of its sphincter becomes an incontinence. Thus also the operation I have proposed by rendering the irritable sphincter vesicæ powerless for spasm, perhaps temporarily incompetent, allows the bladder to empty itself completely, and the cervical mucous membrane to recover its tone.

Operation.—The patient being under the influence of an anæsthetic, Weiss's dilator is introduced into the urethra, and dilatation continued until the urethra is distended so as to admit two fingers. The dilator ought to be passed as far into the bladder as possible, otherwise the branches of the instrument yield too much to the resisting neck of the bladder. It is desirable to dilate slowly, so as to avoid, *as far as possible*, laceration of the mucous membrane of the urethra. In many cases this laceration occurs, although due care has been taken, and much more after-pain results in consequence during the first day or two.

Sometimes instead of Weiss's dilator I have used the conical probe-gorget, designed by my father for median lithotomy, as a guide for the finger, by which the remainder of the dilatation is effected. On the withdrawal of the dilator it is generally found that the urethra still grasps the finger. The dilatation thus attained enables the surgeon to explore the interior of the bladder. Generally the bladder has appeared to be perfectly healthy, being soft and velvety to the touch throughout. Occasionally portions have been raised and indurated, as if ulcerated, but I have thought this sensation might be deceptive, and produced by the corrugations of an empty bladder. I cannot say that I have undoubtedly detected ulceration by the finger in any of these cases. In two or three instances it has turned out that the bladder was permanently contracted to a cavity little larger than a thimble.

[It may be objected to this operation that there is danger of producing incontinence of urine. This, however, is not the case; on the contrary, "it has happened that the operation was rarely followed by any incontinence of urine, and many of the most rapid and most complete cases had not even temporary incontinence. On the contrary, instead of relieving the bladder every few minutes or every hour, they were able to retain their urine the greater part of the night immediately following the operation. Other cases, again, had incontinence of urine for a few weeks. One case for a few months had very little power of retaining urine and then recovered completely, the pain and irritability having been relieved from the first. Two cases that I know of have suffered from permanent incontinence of urine. It does not, however, appear that the liability to permanent incontinence depended upon the degree to which the dilatation was carried."]—*Lancet, Nov.* 27, 1875, *p.* 764.

66.—ON DILATATION OF THE FEMALE URETHRA.

By Christopher Heath, Esq.

Mr. Teale's recent paper on the Treatment of Vesical Irritability in the Female by Dilatation of the Urethra, shows that he and I have unconsciously been working in parallel grooves for some time. I was not aware of Mr. Teale's practice when, in 1871, I adopted a very similar proceeding at the Hospital for Women, Soho-square, to which institution I was then surgeon. Failing to cure cases of painful micturition by other measures, I adopted the plan of rapid dilatation of the urethra with the finger guided by a director, in some cases using a pair of ordinary polypus forceps to commence the dilatation. My idea was that, in some cases, there was a fissure of the mucous membrane analogous to fissure of the anus, but this I was never able to prove,

though the rapid dilatation almost invariably produced a tear in the subpubic portion of the mucous membrane, which might, in some cases, be the continuation of a fissure. In a course of lectures on Diseases of the Female Urinary Organs, which I delivered at Soho-square in February, 1873, I narrated many cases illustrating this practice, and from the number of American surgeons who at that time visited the hospital and saw my practice, I imagine that the introduction of the practice into America is due to my example. I can fully confirm Mr. Teale as to the benefit conferred on many cases by the treatment and its failure in others, and I have never seen permanent incontinence result, though my patients have often been unable to retain the urine for twenty-four hours. I have, however, never pushed the dilatation quite to the extent practised by Mr. Teale, having been content to take one finger as my limit.

In another direction, however, I have pushed on somewhat beyond Mr. Teale, and that is in the application of topical treatment to the female bladder. In cases of chronic cystitis, with purulent urine, I have detected, as I believe, an ulcerated condition of the mucous membrane (for with the left forefinger introduced into the bladder it is easy with the other hand to bring the whole of the mucous membrane into contact with it), and I have then applied a strong solution of nitrate of silver by means of a mop, securely fastened on a wire, and passed through a small vulcanite speculum introduced into the urethra. The effect of this has been, in many cases, to render the urine acid and clear in twenty-four hours, and the tolerance of the remedy by the bladder is remarkable. The solution I have employed has been as strong as three drachms to the ounce, and I have never seen any harm follow even where little permanent good was done.—*Lancet, Dec.* 11, 1875, *p.* 858.

67.—IRRITABILITY OF THE FEMALE BLADDER OF FIFTEEN YEARS' STANDING CURED BY DILATATION OF THE URETHRA AND NECK OF THE BLADDER.

By H. Bendelack Hewetson, Esq., Leeds.

[The case related in the following paper is of great value as bearing direct testimony to the value of dilatation of the urethra in the female for the relief of irritability of the bladder. This curious effect of dilatation in some cases was discovered accidentally by Mr. Pridgin Teale of Leeds, he having dilated simply for the purpose of exploring the bladder; nothing was found, but the irritability was cured.

Mr. Hewetson observes:—"The absolute success attending upon its performance in some cases, and its partial, if not complete, failure in others, render it incumbent on us to keep strict records of the symptoms, general as well as local, which affect females the subjects of irritable bladder upon whom this operation is performed. The extent to which the dilatation of the urethra is carried should especially be noted, since the partial or complete failures may possibly be the result of too cautious stretching from fear of producing incontinence of urine. Moreover, the general symptoms must be taken into account, for it may be that it is upon them that the surgeon is consulted, without the slightest reference being made (as this case will show) to the more delicate point of irritability of the bladder; when it is upon the latter trouble that the general malaise depends."]

Following are the notes of the case:—Miss M., aged thirty-six, sent for me on the night of March 3rd, 1875. On arrival at her home, I found her to be suffering intensely from retention of urine. I relieved her (by the use of the catheter) of a large quantity of urine, such an amount as must have distended the bladder nearly if not quite up to the umbilicus. This point I did not test, being anxious to relieve her without delay from the worst agony of retention. The retention returned in a day or two, and I had again recourse to the use of the catheter.

Her previous history is as follows:—That she was a perfectly strong and robust woman, following the *arduous* duties of a "present day" school mistress until fifteen years ago, when she was seized with an inflammation of the bladder, for such it was termed by her medical attendant. This was followed by the formation of a small abscess in the region of the urethra, which discharged of itself. Since that time her health has been bad, preventing the continuance of her calling. She states that since her recovery from this attack her nights have been wakeful and disturbed by being constantly "every half hour or hour" obliged to get up to pass small quantities of urine with great effort and some pain. She is low and depressed, with almost constant headache, loss of appetite, and continual bearing down, resulting in a total unfitness for prolonged exertion of any kind. She has lost flesh considerably, and has for several years been set down by her numerous friends and medical advisers, to whom she had made no reference to her urinary troubles, as a confirmed invalid. These symptoms were complicated a year ago by pain in passing the motions, which were infrequent and confined. She had not been seized by retention of urine previous to March last. In February last she was, with "questionable propriety," advised to come to Leeds to stay with some friends for the good of her health.

On examination I found the orifice of the urethra to be completely surrounded by warty growths of a considerable size, and on examining the rectum the introduction of the finger was impeded by a very tight sphincter ani. The rectum was baggy, and there was a small external pile. The uterus was in its natural position, and the catamenia were, and had always been, regular, and the urine was natural. Not being able to estimate to what extent the retention was due to the warty growths, and seeing she was suffering considerably from rectal difficulties, I deemed it advisable to negative the possibility of the retention being caused by the warty growths by removing them, and whilst the patient was under the influence of an anæsthetic stretching the sphincter ani with the forefingers introduced back to back sufficiently forcibly to paralyse it for a time and allow the sore produced by the snipping off of the pile to heal; in the same way as one would cure a fissure of the anus, by setting the spasm of the sphincter ani at rest, which, constantly contracting, might possibly be an element, through reflex action, in helping to keep up the vesical irritability.

Accordingly, on March 5th, chloroform having been administered, I completely carried out the above suggestions. The result of this was, that during the next few weeks relief was given to the retention of urine and to the pain in passing the motions; but there was no relief at all from the vesical irritability. Her general condition, with these exceptions, continued as before, and there was a return of the retention of urine at the end of three weeks from the operation.

I had clearly told her a second operation would possibly be necessary should the first fail to give relief, and accordingly, on April 11th, I again placed her under the influence of chloroform, and introducing Weiss's female dilator into the urethra to the extent of about two inches, I then *slowly* separated the blades of the dilator, stretching the urethra so as to admit of the introduction of my forefingers within the bladder while the parts were on the stretch. On closing the blades and withdrawing the instrument, the urethra contracted upon my little finger, so as sensibly to grip it when introduced into the bladder, the coats of which were thickened. There was no foreign body or stone to be detected.

She was very much upset by the chloroform-sickness, which continued more or less all night; there was, however, *no more irritability of the bladder, no retention, no incontinence produced*, and, to use her own words, "I have not passed water so freely for years;" nor had she retained it so long without being disturbed, for the first time she made water was in the evening after the operation, and she was not disturbed during the whole night.

April 14th. She slept the night through, and awoke with little or no headache, retaining or passing her water quite naturally, with the exception of *some soreness.*

16th. She complains of slight pain while passing water, but perfect facility.

19th. She got up in the evening complaining of none of her former symptoms, having lost completely all trace of vesical irritability in eight days from the dilatation of the urethra.

Her progress now continued to be satisfactory and very rapid.

May 4th. She reports her old symptoms to have all disappeared. She sleeps and eats well, and takes a fair amount of exercise.

At this stage I ordered her into the country, where she resides, and returning on May 31st, she reported herself as perfectly well, and has gained three stones in weight. On the day previously she had walked a distance of eight miles without feeling more than ordinary fatigue, and remarked that before the operation "she could hardly trail herself about."

Thus, then, were the miserable and intractable sufferings of years, shutting out this poor woman alike from society and employment, put an end to at once by an operation whose best recommendation is its simplicity and its success.—*Lancet, Dec.* 4, 1875, *p.* 796.

68.—ON DILATATION OF THE FEMALE URETHRA.

By Dr. Arthur W. Edis, Assistant Obstetric Physician, Middlesex Hospital.

The clinical essay of Mr. Teale, the remarkable case cited by Mr. Hewetson in the Lancet of Dec. 4th, and the experience of Mr. Heath, recorded in the Lancet of Dec. 11th, encourage me to publish the notes of two cases that may possibly prove of interest to the profession, as illustrating the necessity of caution in adopting this expedient, and also the importance of excluding other possible causes of irritable bladder before resorting empirically to forcible dilatation of the urethra. I have notes of a large number in my case-book, but select the following as illustrative of many others. The conditions most frequently producing irritation at the neck of the bladder, with painful or frequent micturition, apart from any alteration in the quality or quantity of the urine itself, are chiefly vascular growths in the urethra, cystitis, stone in the bladder, passage of small renal calculi, pressure upon the neck of the bladder from an anteflexed fundus uteri, dragging down of the posterior wall of the vagina (as in cases of prolapsus uteri), fissures or cracks in the urethra, extension of malignant disease from the uterus, or malignant degeneration of the bladder itself.

Case 1.—M. D., aged forty-two, married, sterile, first consulted me in December, 1872, for irritability of the bladder. Micturition was frequent and attended by scalding. The symptoms had come on gradually during the last month or six weeks, and had lately much increased in severity, the patient being obliged to get up several times during the night to pass water.

Examination of the urine detected nothing abnormal beyond the presence of lithates. On examining per vaginam, there was no evidence of any unusual discharge. The vagina was moist and cool; no vascularity of the urethra was apparent; the uterus was normal in bulk and position. No local lesion likely to account for the symptoms was found. On exploring the bladder by means of a sound, no calculus was felt. The only unusual symptom was soreness of the urethral passage, but, as the patient was very nervous, it was thought at the time to be nothing calling for further attention.

Saline aperients with diuretics and restriction of the diet were enjoined, and the patient urged to resist the desire to micturate so frequently.

As the irritability of the bladder and soreness on micturition persisted, a pair of leeching forceps, about the size of an ordinary quill, was inserted, and the blades forcibly dilated so as to distend the urethra. The little finger being then passed, roughness of the posterior wall of the urethra was detected, but as the operation caused much pain nothing further was done. Later on in the day I received an urgent summons to visit the patient, and

found her very weak and faint, lying in a pool of blood and urine. On making a local investigation a distinct jet of bright blood was seen after removing some clots and employing the catheter.

A No. 10 elastic catheter was inserted and left *in situ*, pressure being applied along the course of the urethra by means of cotton wool inserted per vaginam. This arrested the hemorrhage for the time, but on removing the catheter the following morning, the bleeding recurred. A sound coated with cotton wool and saturated with solution of perchloride of iron was passed per urethram, which again arrested the hemorrhage for a time, but it was not until a No. 12 elastic catheter covered with cotton wool steeped in tincture of matico was passed and retained *in situ* for twelve hours that the hemorrhage was finally arrested.

The case caused me much trouble and anxiety, and impressed me forcibly with the risk incurred in resorting to forcible dilatation of the urethra.

The patient convalesced rapidly, regained perfect control of the sphincter within the course of a few days, and had no further symptoms of irritation.

Case 2.—E. H., aged eighteen, single, servant, presented herself as an out-patient, complaining of frequency of micturition. During the day she stated that she could only hold her water for about half an hour, and was obliged to get up at least five or six times during the night to empty the bladder. This condition had been gradually coming on during the last two years, and was always worse about the time of her periods, but had been much worse the last six months. Iron, belladonna, bromide of potassium, chloral, ergot, strychnia, and every other likely drug were given at different times, without more than the most temporary benefit. As the condition remained unaltered, she was admitted as an in-patient at the Hospital for Women.

A careful vaginal examination showed that the uterus was anteflexed, though not to a very marked degree. Buchu, uva ursi, triticum repens, alkalies, and acids gave no relief. Confinement to bed, restriction in the amount of fluids, blisters to the suprapubic region, the adjustment of an india-rubber ball inflated with air per vaginam so as to compress the urethra, injection of two-grain doses of morphia into the bladder, and every other available expedient was tried without avail. At this time Mr. Heath saw her in consultation, and suggested rapid dilatation of the urethra. Chloroform was administered and the operation performed; the neck of the bladder being brushed over with a strong solution of nitrate of silver. The symptoms remained unchanged. The urine was passed between five-and-thirty and forty times during the twenty-four hours (as ascertained by the patient pricking a card with a pin every time she made water).

The case now seemed hopeless. The patient's condition was most deplorable. The frequent necessity for getting up during the cold winter nights, the discomfort from constantly wetting her linen, and the offensive ammoniacal odour produced rendered her existence almost unbearable.

Every method of relieving the bladder having been tried in vain, I thought, before discharging her as incurable, it would be well to try the effect of an intra-uterine stem. After some preliminary passing of the uterine sound, a small vulcanite stem was inserted, but was extruded within a few hours. Having made one with a bulbous extremity this was inserted and retained *in situ*. Within a few days she had perfect control over her bladder, and before leaving the hospital some ten days after the insertion of the stem, she could pass the whole night without getting up, and only micturated four or five times in place of forty during the twenty-four hours. She took a place and remained perfectly well, until one day, hurrying to catch a train, the stem came out, when all the old symptoms recurred. She was obliged to come up to town and have it reinserted, and has done so twice during the last two years. During the present month she has written to say how very grateful she is for the relief, and that she remains quite well.—*Lancet, Dec.* 25, 1875, *p.* 909.

69.—THE RAPID DILATATION OF THE URETHRA IN WOMEN.

By Professor SPIEGELBERG, Berlin.

Prof. Spiegelberg remarks that the great dilatability of the urethra in women has long been known. Large stones have been extracted or passed from the bladder; and in cases of masturbation the urethra has been so much dilated that intercourse has been effected through it. Its dilatation for various reasons has often been practised by the surgeon. Its rapid dilatation is, however, of recent date. It is very painful, and can therefore only be undertaken after the administration of anæsthetics. Either the finger or specula, specially designed for this purpose, may be employed after the external orifice has been incised (Simon). The operation is completed in a few seconds; the bleeding that accompanies it is slight and always free from danger. At most it is only sufficient to interfere with the ocular, but never with the digital, examination. The canal may be enlarged by this means almost to the diameter of an inch without danger. Incontinence of urine is a rare subsequent event. Spiegelberg adopted this measure with great success in the treatment of a case of cramp of the bladder. A woman, aged 24, who had had a child a year previously, consulted him for difficulty of micturition, which first made its appearance after her confinement, at first experienced only at intervals, but subsequently more frequently, whilst it had become more troublesome. The ordinary means of hip-baths, &c., had proved useless, and a ring, introduced for a presumed anteversion, only produced great irritation and discomfort. Evacuation of urine was performed every half hour, was very painful, in jets, and accompanied by tenesmus. The patient was much depressed. The vulva and urethral opening were reddened. The projection into the vagina of the urethra thickened, the urine bright and clear, the introduction of a canula very painful, and after its withdrawal a little blood escaped, uterus normal, no stone. Spiegelberg suspected the presence of a small polypus in the upper part of the urethra or neck of the bladder. He performed sudden dilatation with a Busch's dilator. On introducing a Tobert's intra-uterine speculum, he saw at the upper and narrowest part of the urethra an elongated sore and granulating surface about half an inch long, which did not bleed. He touched it with nitrate of silver, and complete recovery followed. A case of fissure of the neck of the bladder was treated in the same way, and made a rapid recovery. Spiegelberg associates these cases with fissura ani, which also frequently occurs after confinements, and in which forcible dilatation is a sovereign remedy. There are a number of cases of so-called cystitis and urethritis and of neurosis, with painful contraction of the bladder, resembling vaginismus, in which forcible dilatation proves the best means of cure. In one case Spiegelberg discovered, by means of rapid dilatation, a polypus in the lower part of the bladder, which had been for years the cause of trouble, and in the same way he punctured a case of hæmatometra not to be reached per vaginam.—*Practitioner*, *Dec.* 1875, *p.* 448.

AFFECTIONS OF THE EYE AND EAR.

70.—CLINICAL LECTURE ON A CASE OF CATARACT EXTRACTION.

By DR. CHARLES BELL TAYLOR, Surgeon to the Nottingham and Midland Eye Infirmary.

Having decided upon associating an iridectomy with the operation of extraction for cataract, the question arises, shall we do iridectomy now and extract later, or shall we remove the lens and a portion of iris at one and the same time. I should certainly much prefer to make the iridectomy a separate operation, and extract some weeks hence when all trace of the ope-

ration, such as haziness of the cornea at the site of the wound, or congestion of the neighbouring tissues, had passed away. By adopting this course we obtain much valuable information as to the probable conduct of the patient when submitted to the major operation. We ascertain how anæsthetics are borne; whether they occasion much vomiting, struggling, or excessive congestion; or whether the patient has sufficient steadiness to bear the operation without anæsthetics: and it is clear that we may utilise the experience thus obtained to the benefit of both patient and operator when extracting at a later date. The formation of an artificial pupil is in itself but a trifling operation; and a subsequent extraction, when the parts have quite recovered, is much simplified by the previous removal of a small portion of the iris: whereas if the iridectomy is made a part of the operation we have a fresh wound of the iris, corresponding in size to the margin of the coloboma, in addition to the one made in the cornea for extraction; in fact the amount of traumatism, or actual injury, at the time of operation is increased, and it was formerly considered nothing less than a disaster to accidentally slice a piece of iris while doing an extraction. The excision of a portion of iris which follows the first incision is also often accompanied by a gush of blood which fills the anterior chamber, and obscures the subsequent steps of the operation. The raw edges of the recently-wounded iris are apt to be contused during the passage of the lens, and if consequently inflamed, they will often adhere to any remaining portions of the capsule, and contribute to the formation of a secondary cataract. Certainly a preliminary iridectomy is for many reasons the safest procedure. Mooren, of Düsseldorf, to whom we are indebted for the suggestion, operated thus in 62 exceptionally unfavourable cases with two failures only; and some years ago I published an account of 100 similar cases, treated by the same method, with equally good results. But there are unfortunately insuperable objections to Mooren's method which are well illustrated by the case now under consideration. This patient, for instance, cannot afford to stay here for eight weeks; if we do an iridectomy and send her home, she will conclude, so soon as she finds that her sight is not improved, that the operation has been a failure—an opinion that is sure to be loudly endorsed by numerous acquaintances. She would be horrified at the idea of a second operation in the face of such a failure, and we should probably never see her again, even if she were in a position to incur the expense. We must therefore do the best we can under the circumstances, and proceed to extract, making the iridectomy a part of the operation. Shall we do so by the upper or lower section? By the upper section the coloboma iridis is in many patients concealed by the upper lid; and there is evidence to show that the process of healing is to some slight but not very important extent facilitated by this position of the wound. These are the arguments which are used in favour of the upper section; and some of our best operators, notably Mr. Streatfield, of Moorfields, invariably adopt it; but if suppuration should occur, and suppuration is imminent in this case, the downward gravitation of pus and other inflammatory products will form a most unfavourable feature in the subsequent progress of the case. The eye is always turned pretty firmly upwards during anæsthesia, and involuntary, without anæsthetics, by the patient; to turn it downwards with forceps in order to expose the upper segment of the cornea involves the use of a speculum, and is attended with some risk of rupture of the hyaloid membrane, and immediate loss of the eye. The upward tendency of the eyeball, and the downward gravitation of inflammatory products are, on the contrary, rather fortunate incidents if the lower section be adopted; and although I have operated successfully in a large number of cases by the upper section, I think there can be no question that the lens, the capsule, and remnants of cortex are much more easily extruded through an inferior incision: and, contrary to the generally received notion, I have convinced myself that the inconvenience from a coloboma in this situation, especially if it be a small one, is not in excess of one made directly upwards, while the sight is equally good, if not better; this is no doubt owing to the fact that the downward position of the eyeball when *reading*, or gazing at an object, while exposing an upward iridectomy brings *the one* made downwards under the protection of the lower lid. We shall

therefore extract by the lower section, and make the iridectomy a part of the operation. With regard to operating upon both eyes at once, of course it is better to do one at a time; but here again we are often driven by the patient's mental condition, or domestic circumstances, to do that which, if not absolutely the best, is the best under the circumstances. For instance, if I operate upon one eye of this patient, and succeed, she will hardly be inclined to risk the other: if I fail she will be too discouraged to do so; so that I think it will be well to multiply our chances of success by a double venture.

The only question remaining to be considered before we proceed to operation has reference to the employment of anæsthetics. I should much prefer to dispense with anæsthetics in the operation of extraction, on account of the vomiting, congestion, and struggling which they often occasion; but there are many cases, and this is one of them, where the patient's want of self-control is such as to preclude the possibility of operating without first inducing insensibility. If it were not for vomiting there would be but slight objection to the use of anæsthetics, and vomiting ceases to be of much consequence if a piece of iris has been removed, although the repeated straining is very apt to occasion prolapse if the pupil has been left entire. What anæsthetic shall we employ? Nitrous oxide is safe, and scarcely ever causes vomiting, but it occasions struggling, spasm, and a kind of epileptic condition, so that insensibility can seldom be conveniently maintained until the operation is completed: chloroform, bichloride of methylene, and methylene ether are pleasant to inhale, but they all cause vomiting,—that from chloroform sometimes lasting for twenty-four hours,—while the patient is with each of them exposed to the risk of fatal syncope, or death beginning at the heart. Ether is the only available anæsthetic, with which I am acquainted, that is free from this special risk: this constitutes the real superiority of ether as an anæsthetic.

You may well say, if iridectomy is so valuable a resource why not resort to it in every case of extraction? The answer is simply this:—"It has its disadvantages, and is not always necessary; a patient with a large artificial pupil, and no power of accommodation, is apt to suffer from dazzling cosmetic defect, and other inconveniences, which although to be regarded lightly,—considering the paramount importance of restoring light, are, nevertheless, defects which we ought to avoid in all favourable, or even average cases. It would be quite superfluous to remove a portion of iris in moderately healthy patients, with mature cataracts, and in cases where the operation has been completed without misadventure; however desirable it may be to do so in those where these conditions do not exist. In numerous recent cases I have extracted with the same form of incision without mutilating the pupil, and the results have been most brilliant, some of the patients declaring that they saw with glasses not only as well but even better than ever in their lives before; and we can readily understand that, in the absence of other defects, a perfect crystal may more than compensate for the absence of a natural lens which perhaps was never a very brilliant one: in fact there can be no doubt that the iris plays a most important part after extraction; regulating the amount of light admitted to the eye, correcting the aberration occasioned by sphericity of the cornea, diminishing irregular circles of diffusion; contributing to the clearness of eccentric vision, and thus after extraction compensating largely for the absence of the lens. The great danger if we extract without iridectomy is prolapse of the iris. This risk is however much diminished by the instillation of a solution of esserine, or calabar bean, immediately after the operation. Some surgeons hesitate to employ this agent on the ground that if iritis should occur we should have the unfavourable complication of iritis plus a contracted pupil, but in point of fact primary iritis does not come on until the third or fourth day, not until the wound made for extraction has, in the great majority of cases, healed; and the effect of calabar bean may then, if necessary, be completely neutralised and overcome by the instillation of atropine."

I should, as a rule, keep the eyes bound up for a week, and confine the patient to a couch for three or four days. I find the best dressing is a little cotton wool, fine charpie, or French wadding, dipped in a solution of chloro-

hydrate: this disinfects any secretion which may accumulate between the lids, or rather prevents the decomposition which might prove the starting point for suppuration of the wound. The wool is best retained *in situ* by one turn of a domett bandage pinned over the forehead so as to afford slight support to the eye, and thus maintain the edges of the wound in apposition.

This is readily unpinned and turned back, without disturbing the patient, whenever it is necessary to inspect the eye or change the dressing. About eight hours after the operation the edges of the lids should be gently sponged with an antiseptic lotion, just barely separated, and any slight secretion removed. As a rule patients do not have any pain, but if pain should come on after operation it is always a serious symptom, and should be combated *ab initio*. If accompanied by a full pulse, swollen lids, and coated tongue, I generally take blood from the arm, or foot, to the amount of four ounces or more if the patient will bear it, and administer a calomel purge, with a subcutaneous injection of morphia, and apply a compress bandage, with hot fomentations. This was Von Græfe's practice, who assured me, when I attended his clinique in Berlin, that he had learned, by sad experience, never to employ leeches or abstract blood from the immediate vicinity of the eyeball for the first three days after an extraction. In a recent case in which I adopted this treatment, the eye was saved and the patient has now excellent sight, although suppuration had actually set in. After thirty hours the danger of suppuration has, as a rule, passed by, and after the third day any pain the patient may suffer is probably due to primary iritis, which may be detected on inspection, and which is best treated by atropine, morphia, blue pill, and the application of four leeches to the temple, a fresh one being added as fast as one drops off, until the pain is gone.—*Practitioner, December* 1875, *p.* 404.

71.—SECTION OF THE CORNEA IN CERTAIN DISEASES OF THE EYE OF INFLAMMATORY ORIGIN:

ABSCESS OF THE CORNEA: OPHTHALMITIS: IRIDO-CHOROIDITIS SYMPATHETIC (?): WITH A NOTE ON THE TREATMENT OF HYPOPION BY CILIARY INCISION.

By J. Vose Solomon, Esq., Professor of Ophthalmic Surgery in Queen's College, and Surgeon to the Eye Hospital, Birmingham.

Some years since, the late Mr. Guthrie, senior, advised the treatment of large collections of pus in the anterior chamber by a vertical and central incision extending from one side of the cornea to the other, and that a Beer's cataract-knife should be used for the operation. Soon after reading his paper, which was, I believe, about twenty years ago, I tried the plan in a single instance, but was not satisfied with the result; the failure, I am now persuaded, was due to the greatly disorganised state of the eyeball—in fact, to the operation having been too long deferred.

For the last thirteen years it has been my practice to evacuate extensive collections of pus or puro-lymph occurring in persons of feeble constitutional power, and in whom some layers of the cornea had sloughed, or evinced a tendency thereto, by making a radiating incision through the corneo-scleral union and the ciliary sclerotic for a distance of about two lines. There is no method with which I am acquainted more safe or effective; and it has the additional advantage of depleting the engorged ciliary choroid. It was from observing in colliers and labourers who had passed their fortieth year, that a peripheral semi-lunar corneal incision was commonly followed by destruction of the membrane and staphyloma, that led me to confine my puncture almost exclusively to the sclerotic. My colleagues Mr. Bracey and Mr. Owen, who, from having been formerly house-surgeons of our hospital, have

had peculiarly favourable opportunities of judging, and of comparing this method with others, follow the same practice, and are well satisfied with its results.

In the course of 1873 and 1874, I treated successfully by Guthrie's operation (vertical incision), with some limitation as to the length of the wound, several cases of extensive *hypopyon* complicated by abscess, or by diffuse infiltration of the cornea; conditions which were sometimes coexistent in the same eye. The tendency of the infiltration to extend into the adjacent healthy tissue was not always at once checked; consequently, superficial scarifications, punctures, and even a second deep and rather free incision, made at an angle with the line of the first wound, by giving early and facile exit to the pent-up purulent matter, were employed with advantage. In all cases it is superfluous to state that preventable causes of debility, as, for instance, over-suckling, should as a matter of course be removed.

In the administration of quinine I generally prefer to give half or a whole grain every hour to a large dose at intervals of four hours; in this way, I believe, the occurrence of suppuration in an organ may be sometimes lessened in extent, if not averted.

Whatever operation is performed, the warm water pad proves for the first few days a valuable local application. Drops of atropine and nitrate of silver are also useful where the local reparative power is defective.

The good effects of treatment by vertical incision may be summarised as—relief from pain, which is *not* always immediate; the preservation of a more perfect curve of the cornea than where the membrane has suffered ulcerative perforation, and consequently a less degree of astigmatism; frequently the prevention of synechia anterior, and staphyloma; also a less extent of any leucoma which may follow the presence of an onyx.

I now come to the chief and almost sole object of making this communication to the Association, namely, *the application of free section of the cornea to cases of deep seated ophthalmia threatening destruction of the eye.* I am indebted to our intelligent house-surgeon Mr. Eales for many of the notes of the two following suggestive and instructive cases.

Case 1.—A little girl, aged 12 months, was admitted under my care at the Birmingham Eye Hospital, on August 20th, 1874, with acute photophobia and muco-purulent conjunctivitis of the right eye; the cornea was throughout densely opaque. The child, always delicate, had suffered from diarrhœa for three weeks immediately prior to the appearance of the ophthalmia. On the ninth day of admission, the conjunctival discharge had ceased, but protophobia, with severe pain, which had deprived the child of rest and sleep from the time of admission, continued. At this time, an examination made under chloroform revealed great congestion of the conjunctiva and sclerotic, especially in the ciliary region; the cornea was so gorged with lymph that no iris was visible. A little above the transverse diameter were noted two small rough eminences consisting of lymph, probably points from which pus had escaped. Tension + 1. The aspect of the eye was most unfavourable. While examining it, the possible usefulness of a free incision of the cornea as a preventive of sloughing of the part and a relief to the tension suggested itself, and at once I carried the idea into effect; making the wound not vertically but somewhat horizontally through the more dense part of the corneal infiltration, and on a level with the upper border of the pupil. The relief was rapid; sleep at once returned, and the day restlessness ceased. The whole periphery of the cornea began to clear. On September 15th, the twenty-sixth day of treatment, the patient returned home to Evesham.

On November 23rd Mr. Eales made the following notes. "The iris can be plainly seen all round, the cornea being merely nebulous at this part. In the centre and the immediate neighbourhood of the line of incision, the leucoma is dense. No relapse of ophthalmia since the incision was made. No staphyloma, no synechia." The child was too young to admit of the state of the retina being tested.

The results which followed operation in this case suggest the possibility of curtailment of the duration of some cases of keratitis by a resort to section of the *part most deeply infiltrated*, and so allowing of escape of the exuda-

tion *inclosed* in the proper substance of the cornea. That the eye was saved from destruction by the special treatment adopted can scarcely admit of doubt.

The next case presents features of still deeper interest to the ophthalmic surgeon.

Case 2.—*Irido-choroiditis of the Right Eye, and Collapse of the Left Globe from Sloughing of the Cornea consequent upon Scarlatina Aginosa.*—Edith Rogers, aged 7, was admitted into the Birmingham Eye Hospital, August, 31st, with acute iridochoroiditis of the right eye and collapse of the left, attended by great irritability and acute conjunctivitis on both sides. The child was in low health, having suffered at Christmas 1873 from scarlet fever, which was followed in two months by dropsy of the hands and feet. The ophthalmia commenced about a week after the onset of the fever, and the left became in three weeks blind from sloughing of the cornea. Inquiries from the mother elicited that she could read six weeks after the fever, but that it "injured the eyes." On admission, the state of the ocular tissues was as follows. In the right eye, great congestion of the external tunics, and of the choroid veins; iris greenish, devoid of lustre, and rather woolly on its surface; the pupil black, circular, and contracted to a diameter of one-twelfth of an inch, insensible to the mydriatic effect of atropia; the cornea clear. Tension—1 to 2. The left globe was collapsed, its conjunctiva tumid and highly inflamed. Intense photophobia affected both eyes. The patient, it was said, had never complained of pain.

Treatment.—The inflamed stump was excised, with some temporary benefit to the right eye.

On October 12th, six weeks after admission, finding the state of the right eye and its vision were in no degree different to what they were before excision was performed, I considered the proposal of a resort to some surgical operation with a view to arrest the persistent irido-choroiditis. Iridectomy was dismissed as inapplicable, from the probability of being followed either by a destructive ophthalmitis, or closure of the enlarged pupil by an irido-capsulitis. Peritomy I determined to keep as a reserve in case of the failure of the proceeding that was adopted; which consisted in the making, during the anæsthesia of chloroform, a vertical incision in the cornea, at mid-way between the outer side of the pupillary border and the corneo-scleral epiphysis. The extremities of the wound were by design not extended to the margin of the cornea, as I conceived that the process of repair set up in such a wound would be more likely to relieve the cyclitis than if the incision terminated near to the roots of the iris. The eye was dressed with the hot-water pad. On the seventh day of the operation, a marked retrocession was observed in all the objective symptoms. The iris was bright, but still greenish in colour; the conjunctiva and sclera uninflamed; the latter presented a few dilated and tortuous veins upon its surface. Tension—1½.

The vision improved so much that the child could guide herself and pick up pins from the floor of the day-room. Her health also underwent a change for the better. The state of the vision in the course of the two months the patient remained in the hospital after the date of operation varied at uncertain intervals, and occasionally a patch of redness would appear on the scleral conjunctiva, and be attended by undue sensitiveness to light, but there was no return of the iritis. On Dec. 14th, she returned home. The iris was bright, but greenish in colour; the pupil clear and immobile; some scleral injection was present, and irritability to light. Vision about her usual average; she counted fingers at twelve inches. Tension—1½.

In the first of these cases, the destruction of the cornea and formation of a large staphyloma mere imminent, and were unquestionably prevented by free incision of the infiltrated and gorged membrane.

The second is an example of an extremely rare sequela of scarlatina, unless we view the irido-choroiditis as bearing the relationship of sympathetic ophthalmia to the inflamed stump. I do not pretend to make even an attempt to decide so intricate a question, but content myself with drawing the attention *of surgeons* to the evident safety of the plan adopted in a class of cases which *has hitherto* proved little, if at all, amenable to any kind of treatment; and I *would fain* hope that surgery has acquired, in free section of the cornea, an

addition to her scant and imperfect armoury for doing battle with one of the most destructive internal inflammations of the eye.—*British Medical Journal, March* 18, 1876, *p.* 343.

72.—EXAMINATION OF THE EYEBALL BY LATERAL OR OBLIQUE ILLUMINATION—OPHTHALMO-MICROSCOPE.

By HAYNES WALTON, Esq., Ophthalmic Surgeon to St. Mary's Hospital.

It is seldom that students are taught to examine the surface of the eyeball, a matter of instruction little inferior to teaching how to examine with the ophthalmoscope. It is my intention to show you how this is to be done by what is called lateral illumination.

This method, then, of lateral illumination, is effected by incident light. It is particularly suitable for examining the anterior part of the eyeball, both without and within. By brilliant illumination of this kind objects which might be overlooked by the diffused daylight are clearly discerned, and diagnosis is furthered. The cornea, the iris, the pupillary margin, the capsule of the lens, the ciliary processes, and even the front of the vitreous humour can thus be inspected. The impaction of minute extraneous substances in the cornea, and corneal nebulæ, are rendered very apparent by it. The differene between phlyctenular and interstitial corneitis is made more palpable. Plastic deposits on the capsule of the lens are well shown. The nature of a cataract is more easily determined by this than by any other mode of examination. The consistence of the cortex of the opaque lens and the colour and density of the nucleus can be told only by it. Opacities in the vitreous humour that are solid and always appear black when examined with the ophthalmoscope are now seen, when sufficiently anterior and small, in their natural colours and in their proper positions, and the inequalities of their surfaces and other physical peculiarities can be estimated.

Examination by Artificial Light.—A darkened room is better for a beginner; one that is partially illuminated will suffice for an observer who is experienced in the method.

The patient is placed, sitting or standing; the bright flame of a lamp is arranged at the side, on a level and a little behind his head. The observer takes his position in front of him, and holds a bi-convex lens of three, two and a half, or two inches focal value, in such a manner and at such a position as to receive the lamp rays, and to condense or focus them on the region of the eyeball to be examined.

The fullest amount of illumination is got by placing the patient close to the lamp and using a very high lens.

Any special point to be examined must be placed exactly under the focus of the lens.

For examining the crystalline lens the degree of obliquity of the cone of rays must be less, as the equatorial portion is inspected, and greater as the pole is looked at.

In examining the vitreous body the rays must be thrown in the greatest obliquity. The observer should be prepared to find the interior of the eyeball no longer black, but purple or smoky.

The object examined may be magnified by the observer using a convex lens, the selection of which should depend on the nature of his own state of sight.

Mr. Walton now gave a series of demonstrations on patients in illustration of his discourse.

Examination by Daylight.—The lateral illumination by natural light is not new. I saw it in use when I was a student. After the above description it is unnecessary to say how this is to be done. It is enough to remind the reader that the patient should be placed near a window, and in as strong a diffused light as can be got.

Dr. Heddaens has strongly advocated the use of this form of examination.

He uses a pencil of rays admitted through a central perforator, from one to two inches in diameter, in a screen sufficiently large to shield the head of the patient from diffused light. The pencil is concentrated by a lens in the usual way. The doctor claims for it the advantages of showing objects in more natural colour, of easy application, and an absence of discomfort to patient and observer. He avoids sunshine, and finds the diffused light even of a cloudy day sufficient for all purposes.

Ophthalmo-Microscope.—This is merely a common hand microscope, with which an examination of the object is made by reflected light, and for the most part employed with lateral illumination of the eye. The chief use of the instrument is for minute clinico-pathological research in the living eye, for the better seeing of corneal deposits, minute vessels in the cornea, minute changes in the iris, and in the lens. For practical purposes it possesses no advantages over the simple microscope or lens. The instrument may be used as a fixture, and screwed to the table for the purpose of steadiness. That of the kind most known has arrangements by which it rests on the patient's face. Such an one is delineated in Wecker's "Etudes Ophthalmologiques." —*Med. Press and Circular, Dec.* 29, 1875, *p.* 529.

73.—ON CONJUNCTIVAL TRANSPLANTATION FROM THE RABBIT TO THE HUMAN SUBJECT.

By Dr. J. R. Wolfe, Surgeon to the Glasgow Ophthalmic Institution, and Lecturer on Ophthalmic Medicine and Surgery in Anderson's University.

For a number of years I have practised an operation for the radical cure of symblepharon, by taking a portion of the neighbouring healthy conjunctiva of the eyeball wherever I can get it, and supplying the palpebral conjunctiva which has been destroyed; for the loss of conjunctiva oculi, even to a very large extent, is generally regenerated without prejudice to the neighbouring tissue, whilst loss of the conjunctiva of the eyelid is sure to damage the cornea by friction. Mr. Teale had first introduced this operation, which I practised independently with considerable modifications.

But there is a limit to the extent to which we may go in borrowing conjunctival substance from an eye which has been already injured; if we surpass that limit, the corneal opacity is sure to extend still further, and we lose the last chance of saving vision. Indeed, we sometimes meet with cases in which the infliction of a new wound (in peeling off conjunctiva) would amount to destruction of the eye. It is in these desperate, I would say almost hopeless, cases that I have devised the method of making up the deficiency by transplanting a portion of the conjunctiva from the rabbit. This method has since been practised by von Wecker, Otto Becker, Albrecht Graefe, in cases of symblepharon; and Professor Cohn has shown a case in which he successfully transplanted the conjunctiva from the rabbit into the right eye of a boy five years old, for the cure of the deformity resulting from the removal of a large melanotic tumour of the eyeball.

The method having thus had some years' trial by such competent authorities, I shall not enter here upon the theoretical vindication of the procedure, but merely show you two patients upon whom the operation has recently been performed, which will enable you to judge for yourselves of the utter hopelessness of any other method, and of the satisfactory result obtained by this.

Case 1.—F. B., aged nine, had his right eye burned with lime in January, 1875, producing adhesion of the lower eyelid to the eyeball to the extent of covering the greater portion of the cornea, the cornea being thus rendered almost entirely opaque, with the exception of the small upper and outer segment. On lifting the upper eyelid the pupil was seen covered by the adherent lower eyelid, and there was no conjunctiva of the eyeball left available for supplying the deficiency. I therefore first turned the transparent portion

of the cornea to account by making an artificial pupil upwards and outwards, whereby I restored a considerable amount of sight. Having procured this advantage, I operated ten days ago for the cure of the symblepharon, by transplantation from the rabbit. I would request the gentlemen present to take a careful view of this patient. You will see that some of the ligatures are still in the new conjunctiva from the rabbit, and on seizing the loose portion of this new membrane with the forceps, it will show you clearly beyond any possibility of mistake, the vitality of the transplanted portion; you will see that same membrane has some greyish points here and there, while the rest of its surface has assumed a shining pinkish appearance. You will see also the mobility of the eyeball, and the action of the eyelid restored.

Case 2.—P. C., aged 25, quarryman, received an injury in his face and eyes from a gunpowder explosion in January, 1872. When he first came to the Glasgow Ophthalmic Institution, four months after the accident, his face was quite riddled and discoloured by powder; both upper and lower eyelids of the right eye were considerably everted, and the left eye was completely closed and blinded by symblepharon. I made an iridectomy upwards, which resulted in tolerably good sight when the upper eyelid was raised. On presenting himself in January, 1873, I remedied the symblepharon by transplantation from the rabbit.

In July, 1875, he came for the treatment of the everted eyelids of the right eye, when I found that a small bridge had formed in the new conjunctiva, which did not mar the result of the operation, this being, indeed, his best eye. However, I separated the bridge, and supplied a new conjunctival flap from the rabbit a fortnight ago.

The examination of this eye will greatly aid us in the appreciation of the method. The extent of the corneal opacity in this case will show the amount of the original injury, which time has considerably repaired. We can also compare here, in the same eye, both the old flap inserted about two years ago, and the new small bridge supplied only a fortnight ago, and judge of the satisfactory result.

Now, I will proceed to give a detailed account of this operation.

I generally put both the patient and the rabbit under chloroform. I then separate the adhesions so that the eyeball can move in every direction. Next I mark the boundary of the portion of the conjunctiva of the rabbit which I wish to transplant by inserting four black silk ligatures, which I secure with a knot, leaving the needles attached; these black ligatures indicate also the epithelial surface, which would be very difficult to distinguish after separation. I take from the rabbit that portion of the conjunctiva which lines the inner angle, covering the membrana nictitans, and extending as far as the cornea. I select this on account of its vascularity and looseness. The ligatures being put on the stretch, I separate the conjunctiva to be removed with scissors, and I transfer it quickly to replace the lost conjunctiva palpebræ of the patient, securing it in its place by means of the same needles, and adding other two stitches, or more, if requisite. Both eyes are then covered with a bandage and dry lint. For the first forty-eight hours the conjunctiva has a greyish look, but it gradually loses that appearance, and, with the exception of some isolated patches here and there, it becomes glistening, in some parts looking not unlike conjunctival thickening. These patches gradually decrease until the whole assumes a red appearance.

Should any irritation set in, I apply warm-water fomentations. With regard to chloroform, Professor Cohn operates on the rabbit without anæsthetics, and I should myself prefer to do so if I could manage satisfactorily, for rabbits do not stand long anæsthesia; but the struggles of the animal are a very great obstacle in the way of the careful dissection required. With regard to the patient, it must be borne in mind that it is a long and tedious operation, taking about three-quarters of an hour in its performance; and that under no circumstances is it safe to maintain insensibility throughout the whole process. In a grown-up intelligent person, therefore, I do it without chloroform; and in the case of the young boy referred to, I put him under chloroform only during the first stage—namely, while separating and dissect

ing the adhesions,—and completed the rest by coaxing the patient into submission.

Accidents during the operation.—It is always desirable to have at least two rabbits at hand in case one should succumb under chloroform. I may mention also that in one of the operations, after putting the ligatures on the stretch and dissecting the portion of the conjunctiva which I marked out for removal, two of the ligatures with half of the conjunctiva tore away from the rest. To give up this eye and proceed to operate on the other eye of the animal would not have been advisable, on account of the time required to do so; I therefore determined to proceed with the operation in the following manner: —I spread out the portion of the conjunctiva thus removed upon the back of my left hand, and the needles and ligatures attached to it I held in the palm of the same hand, and proceeded to remove the rest of the conjunctiva from the rabbit, and, by means of the remaining two ligatures, I fixed this on the conjunctiva palpebræ. This accomplished, I turned to that portion of the conjunctiva spread out on my hand, which I found dry and firmly adherent to the hand; a few drops of warm water put upon it sufficed to soften it and make it relinquish its hold of the skin, and I then transferred it to its proper destination.

Von Wecker puts the conjunctiva upon a watch-glass, and warm water underneath; but I consider the process accompanied with many inconveniences, and I would never resort to it myself except in a case of emergency. I consider quick transplantation, without previous handling and preparing that delicate membrane, decidedly preferable.

The needles which I employ are half-curved No. 12, which Weiss makes for the purpose. Two small silver spatulæ are also requisite for spreading out the conjunctiva. There are various kinds of needle-holders, but I find my own fingers most suitable for the purpose.

In conclusion: although, as stated before, I have resorted to this method only in hopeless cases, when there was no disposable neighbouring conjunctiva of the burnt eye for supplying the deficiency, I found the result so highly satisfactory that under no circumstances would I think myself justified in removing healthy conjunctiva from an injured eye; but in all cases I would supply the deficiency from the conjunctiva of the rabbit, as being the safest and best method now at our disposal for the cure of such injuries.—*Lancet*, *April* 8, 1876, *p.* 526.

74.—ON A NEW METHOD OF MAKING PERVIOUS THE EUSTACHIAN TUBE AND OF INFLATING THE TYMPANUM.

By Professor Dr. Joseph Gruber, Superintendent of the Clinique for Aural Patients in, and Aural Surgeon to, the Imperial General Hospital of Vienna.

[There is often great difficulty in catheterising the Eustachian tube from obstructed conditions of the nasal meatus, and from the nervousness and timidity of the patient. There are very few men who have had any great experience in the operation.]

One of the chief aims that we commonly have in view in passing a catheter is to blow air through the Eustachian tube into the cavity of the middle ear—a procedure which is briefly designated as the air-bath, and the employment of which in aural surgery, as is pretty well known, is, of all the means of treatment that we as yet are aware of, that which is the most often indicated and the most frequently used. And, in short, it is consequently desirable that we should know of some means of giving the air-bath, which would permit of our attaining the same, or at least approximatively the same end, without the introductio nof the catheter into the Eustachian tube.

The method which has of late years been employed with much success for this purpose is that which was first described by A. Politzer. This, as is *well known*, is as follows:—The patient having taken a small quantity of *water in his* mouth, the end of the nozzle-piece of one of the india-rubber

bags, which Leiter (the instrument-maker) has specially constructed for the purpose, is passed about half an inch up the nose; the nostrils are next hermetically closed on the nozzle-piece by means of the thumb and forefinger of the operator's left hand, and then during the swallowing of the water, which the patient has to perform at the command of the operator, the latter, holding the bag in his right hand, suddenly compresses it.

According to the generally entertained views on the subject, the upper part of the pharynx at the moment of the act of swallowing is by the contraction of the structures of the throat completely cut off from the lower portion of the pharynx, and at the same time the tuba Eustachii opens, whereby it happens that the air compressed in the nasal cavity, being prevented from escaping in other directions, passes through the tube into the cavity of the middle ear.

In spite of the very valuable gain which practice has derived from this method, it nevertheless presents many drawbacks, to which we shall refer later on when we have described the new method.

Lucae more recently, on the basis of observations on the function of the soft palate and the Eustachian tube, which observations he had the opportunity of making by direct inspection of the functional parts in the case of a patient who presented an extensive deficiency of the nose, recommended that for the inflation of the tympanum the nozzle-piece of the bag should be introduced into the nose just as in Politzer's method, and that while the patient intoned the vowel *a* the bag should be compressed. During the phonation of the vowel *a* the soft palate becomes tense and shuts off the upper pharynx, and then air can be forced as in Politzer's method, through the tube into the tympanum.

I purpose referring again in another place to these labours of the distinguished author, and will here only briefly mention that I have convinced myself that it is possible in many cases to drive some air into the tympanum in the manner described, and that, as the author himself specially pointed out, this method may be useful in the treatment of small children.

In the treatment of adults, namely, when it is a question, as in such cases it is apt almost always to be, of overcoming a stronger resistance in the tube, the method recommended by Lucae is certainly not easy of accomplishment. For in the case of morbid changes in the tube—and with such we have chiefly to deal—the air entering the pharynx quite easily overcomes the obstacle offered to it by the slight tension of the soft palate during the phonation of the vowel *a*, and finds vent downwards without getting through the Eustachian tube into the tympanum.

In order that the air may enter the tube with the requisite force, it is indispensably necessary that the closure of the upper pharynx should be such as is capable of offering a strong resistance; and to attain this in a simple manner a mere swallowing movement, or some movement analogous to it, is sufficient; and since in the employment of the swallowing movement, as in Politzer's method, I have found many disadvantages, I thought of an analogous one, and I believe I have found a better one for our purpose.

I will now proceed to describe it, giving at the same time the description of the method which I shall recommend in association with it.

It relates, as I have often mentioned, to the best possible closure of the upper from the lower pharynx, in which the muscles of the soft palate and co-ordinately the muscles of the tube shall enter into action. All this is attained by simply pressing the root of the tongue against the hindermost segment of the palate, if at the same time a powerful expiration is performed. In pressing the hinder segment of the tongue against the palate the cavity of the mouth is cut off from the throat, and at the same time the soft palate is pressed upwards and backwards. The air which, owing to the simultaneous expiration, enters the throat, finds egress neither through the mouth nor through the nose—a fact which may be readily proved by holding before the nose at the same moment either one's hand or a small flame. The flame is not disturbed even in the slightest degree, and the hand does not perceive the least sensation of a breath of air during the expiration, which, however, it certainly would if air issued from the nose. The stronger the expiration, the more tense is the soft palate rendered by the air

that passes from the lungs into the throat, and so much the more resistant is the closure of the upper pharynx. This moment, on account of the position of the structures of the throat, would be the fittest for imparting the greatest possible force to air forced out of a bag inserted in the nostril.

If we always had perfectly tractable patients to deal with, we would certainly employ this position. However, as this is not the case, we must be contented with such movements as approach as nearly as possible those just described, and these, according to the studies which I have made as to this point on myself and on patients, are those which are caused when we pronounce the consonants *hck* (= *hkk*) in the most accentuated manner. Since, however, even with respect to this, it is necessary to have regard to the varying intelligence of patients, and since it is not always a matter of the firmest closing of the upper pharynx, and since it is easier for the surgeon if he directs the patient to repeat after him a full syllable, he can intercalate a vowel as in *hack*, *heck*, *hick*, *hock*, *huck*.

If we pronounce the above-named syllables in the order here written down, we may convince ourselves that the tongue becomes drawn further backwards and more strongly upwards as we proceed with the list of syllables, so that with the syllable *hack* the tongue is most forward, at the syllable *huck* it is pushed furthest back to the upper part, and that in like proportion the upper pharynx is contracted and forcibly shut off. The closure is still more forcible, and carried further backwards, by the pronunciation of the consonants *hck* than it is by the syllable *huck*. We have therefore in this series a gradation, or, as it were, a scale of closure of the upper pharynx, which, as we shall see later on, is very useful.

As the reader has already noticed, the syllables are always written with *ck* (or equally *kk*), to which I need scarcely add that the *k* must be strongly accentuated. In proportion as the speaker may please to strengthen this emphasis, so is he thereby, and indeed very considerably, enabled to close firmly at his pleasure the upper pharynx.

If we now attempt to pronounce one of these syllables we notice peculiar changes in our ears. We remark each time a distinct movement in the membrana tympani, and by no means unfrequently a noise resembling that produced by the Valsalvian experiment. It consequently follows that in this experiment also the air must enter by the tube into the tympanic cavity, and that the tube during this experiment is opened.

The details of the method which, based on all these data, I now recommend for the above-mentioned and other analogous purposes are as follows:—

The operator stands, or sits at his convenience, face to face with the patient. The end of the nozzle-piece of a rubber bag, which the operator grasps in his hand, is introduced into the inferior nasal meatus of the patient for about half an inch, and the operator at once hermetically closes the nostrils on the nozzle-piece of the bag with the fore and middle finger of his other hand, and while the patient at the word of command pronounces one of the before-named syllables (*hack*, *heck*, *hick*, *hock*, *huck*, *hck*) the bag is squeezed. Thereupon the air passes with a distinctly perceptible noise through the tube into the cavity of the tympanum.

The noise which is produced by the forcible entry of the air through the tube can be auscultated with precision by means of the otoscope. In cases where the membrana tympani is perforated, the well known perforation sound is produced. The patient feels a distinct sensation of the entry of the air into the tympanic cavity. The membrana tympani exhibits, on inspection, quite distinctly the well known appearances—in short all the signs of an entry of air into the middle ear having taken place are present, provided the tube is not impermeable in such a degree as to resist also other modes of procedure.

If during this procedure, I cause the patient to incline his head strongly towards one shoulder, it almost always happens, especially when I insert the bag into that nostril which corresponds to the ear in which I desire to drive the air, that the air flows into the ear directed upwards—that is to say, the *one that is* turned away from the shoulder. In cases where the air also entered *the other ear*, it nevertheless almost always happened that the patient felt

the air more strongly in the upward turned ear. If the patient with this kind of procedure had once confidentially declared that he felt the air in one ear, he had also the same sensation if I repeated the trial, either several times in succession or on different days. Whether in this particular position the muscles of one side possibly act more energetically, or whether the forced-in air more readily follows the upward direction, or whether in this position the expired air exercises a stronger pressure on the one half of the soft palate, and so shows the way to the air driven in through the nose, I am unable to say. I would also make these latter statements with all reserve, and only point them out since it would obviously be of inestimable value if we had a means of this kind by which we might be able to drive air through only one tube. To sum up, the advantages possessed by this process as compared with Politzer's are as follows :—

First, it is much simpler, the swallowing motion being no longer required. There is no swallowing of water either. To appreciate this boon, one ought to be acquainted with the unspeakable loathing patients, as a rule, evince for drinking the water, although I have practised this process much less frequently than others. A large number of glasses used to stand in readiness on my consulting table, and yet patients used to be compelled to make an almost superhuman effort just to sip water out of my glass. Indeed, we cannot well blame them for this if we take into consideration that a practitioner's consultation-room must be accessible to all patients, let the nature of their diseases be as contagious as it may.

Apart from this, however, if the process is to be repeated more frequently, the swallowing of water becomes not only troublesome, but actually painful. To the objection that the patient might make a swallowing motion even without water, I reply that in such cases the driving-in of air through the tubes proves often unsuccessful, and that the repeated unsubstantial swallowing is even more painful than the swallowing of water. We will say nothing of cases in which, owing to concomitant throat diseases, the swallowing is painful; neither need we dwell upon the fact that when such an attempt is made the air not unfrequently gets into the stomach, producing violent pain, which does not subside until the stomach has discharged this air by repeated eructation.

2. By keeping the throat structures for a more protracted period in the position of the ending of the syllable (*i.e.*, of *k*) one is enabled to let the air pass somewhat longer through the tubes into the cavity of the tympanum, which is perfectly impracticable during the short act of swallowing, which, as it is well known, cannot be protracted.

3. Taking the above scale into consideration, the air may be pushed with any amount of power at choice through the tubes; and this advantage is to be valued all the more that we know that, owing to the rapidity with which Politzer's process—if it is to succeed at all— must be put into operation, the membrane of the tympanum has often been ruptured.

4. This process, if applied to self-treatment, must needs be much more advantageous, since the patient, guided by his own feeling, may intensify at will the pressure of the air entering the cavity of the tympanum.

I now beg to recommend this process to my highly esteemed *confrères*, hoping that they also will make their experience on the subject public.—*Medical Times and Gazette, Jan.* 1, 1876, *p.* 7.

AFFECTIONS OF THE SKIN.

75.—ON THE TREATMENT OF CHRONIC ECZEMA BY GLYCEROLE OF SUBACETATE OF LEAD.

By Dr. BALMANNO SQUIRE, Surgeon to the British Hospital for Diseases of the Skin.

[The remedy proposed by Dr. Squire is new to therapeutics, and the view suggested by its use as to the nature of eczema is contrary to that usually entertained. This view is that the affection is a local, and not a constitutional one, and may be successfully treated by local remedies only.]

Many of the profession are well content to employ local remedies in that disease, and even to place considerable reliance on their instrumentality : of such local remedies, not to enter into wide detail, by far the most popular in this country is the benzoated oxide of zinc ointment. I take it that more of this ointment is prescribed in the treatment of chronic disease of the skin within the United Kingdom than of any other kind of ointment. I feel sure that most practitioners have used a larger quantity of this ointment in the treatment of chronic eczema than they have of any other local application. Of late years, however, this popular application has had a rival in the unguentum diachyli, which has been adopted from Vienna—a dilution of diachylon-plaster, with olive oil to bring it to the consistency of ointment. Neither of these applications would have become so generally used unless they possessed some efficacy. I have tried them both very often indeed, and I quite know them to be useful remedies. However, long before diachylon ointment had become popular over here,—certainly long before I myself knew of it,—I had endeavoured to find something more efficient than the zinc ointment, which I had often found to fail of anything like efficiency, and I thought I had found this in lead ointment : I accordingly tried the acetate of lead ointment of the Pharmacopœia—that is to say, a mixture of the powdered crystals with lard. I soon, however, had reason to think, on trial, a mixture of the subacetatis plumbi liquor (Goulard's extract) with lard a more efficient application by far. At length, however, I took to using glycerine in place of lard as a vehicle for applying that remedy. I had previously tried water, in fact, lead lotion of various strengths. Lead lotion of moderate strength (℥ ss. ad ℥ j.), used as an evaporating lotion, is, indeed, in my experience, one of the most excellent applications for acute eczema; but in chronic eczema I have found it of very little service. Here, lead ointment becomes much more valuable. I venture to say that I feel sure, from ample experience, that lead is an infinitely more suitable agent in the local treatment of eczema than zinc. Lead, however, has been but little used in this country for the purpose. The agent that has been, and still is, chiefly in vogue for this purpose is zinc. It would not be untrue to assert that for some time past—how far back that time may reach I am unable to say—the two principal prescriptions for skin disease in this country have been zinc ointment and zinc lotion. As to the zinc ointment, it is a tradition that it must be *benzoated* zinc ointment. It is probably not generally known to prescribers that this stipulation is a very immaterial one, and from one point of view even a disadvantage. The addition of the benzoin is simply to preserve the ointment (somewhat imperfectly, however) from becoming rancid when stale; and this lame safeguard is apt to induce the pharmacist to keep it (since it is much in demand) in stock, whereas ointments of any kind should always be made fresh, and prescribed in such moderate quantity that they may always be expended rapidly, for no artificial preservation of them will enable them to bear comparison with the fresh preparation. As to the zinc lotion, it has been the fashion to colour it with calamine, and the same kind of tradition has preserved the erroneous belief that the calamine is in some sort an essential therapeutical ingredient of the lotion. Lead, however, *is, I am well* persuaded, by far a more soothing, and at the same time a much *more astringent* application than oxide of zinc. I have found that it unques-

tionably allays the itching, restrains the discharge, and diminishes the hyperræmia of eczema; in short, it *cures* it far more speedily than zinc does. It is of the best mode of applying this efficient agent in the treatment of chronic eczema that I have now more particularly to speak. As a lotion it fails, and I think it is not difficult to see how this happens. The lotion fails to keep the surface moist: the warmth of the body speedily causes it to evaporate: that is to say, the water passes off as vapour, and the lead is left on the surface of the comparatively dry gummy layer of viscid exudation which is characteristic of eczema. Thus the remedy is precluded very considerably from influencing the skin itself, and is deposited simply on the surface of the scab, however minutely dotted and however thin that scab may be.

Lead ointment is far more efficient. It preserves the moisture of the secretion, and so permits of the passage by osmosis of the remedy from the ointment through the secretion to the surface of the skin.

I have already declared my experience to be in favour of ointment made with Goulard's extract, in preference to the Pharmacopœial preparation made with the powdered crystals of the solid acetate, but I must also declare my experience to be very greatly in favour of either of the above to the Viennese preparation (recently imported) of diluted diachylon plaster. The latter is, to begin with, a very uninviting, putty-like substance, quite like putty softened by admixture with oil.

I have found that for the majority of cases of chronic eczema greasy preparations of any kind are *pro tanto* a disadvantage: they appear to act in a minor degree in the same disadvantageous manner that water-dressing covered by oilskin does. I was accordingly induced, when I had fairly satisfied myself that lead was a good agent, and that the basic acetate of lead was a good form of exhibiting that remedy, to seek some more favourable vehicle for exhibiting it in cases of chronic eczema than grease of any kind had seemed to me to be (I had tried, amongst other vehicles, oil). Glycerine has proved in my hands far superior either to oil or water as a vehicle for applying remedies in the case of chronic eczema. It has neither, so to speak, the desiccating effect of water nor the macerating effect of grease. Its viscidity is about parallel with that of the viscid secretion proper to eczema, so that, in smearing it over, it is readily miscible with it, and while it preserves the surface moist, it readily incorporates itself, and, more than that, undergoes true admixture or diffusion (osmosis) with the viscid aqueous solution of lymph and albumen which is exuded slowly but continuously from the surface of the diseased skin. Thus it conveys the remedy held in solution by it more freely to the actual surface of the skin itself. At the same time it fulfils an indication which is less perfectly attainable by the use of ointment: it adheres more closely to the comparatively moist surface of eczematous skin than ointment does, and so is less readily rubbed off by accidental friction. In this way it more efficiently preserves a uniform suppleness of the skin affected by eczema—a matter of importance in more than one respect, for not only is the patient relieved from the hide-bound feeling which is one of the chief distresses of chronic eczema, but the chapping and cracking of the skin, caused by the partial splitting on every movement of the body of the inelastic varnish formed on its surface by the partially dried-up exudation, is avoided: and this latter phenomenon is one of the main aggravators and perpetuators of the eruption.

That glycerine possesses ample capacity for penetrating serous secretion may be proved by repeating an experiment which I have often had occasion to make in prosecuting microscopical researches into the minute anatomy of the morbid skin. I have been in the habit often of preserving small portions of skin (removed by operation) in glycerine, so as to preserve them from putrefaction till I had leisure to examine them. It will be found that in a short time a piece of skin so immersed has undergone throughout the whole of its thickness a very marked change in its physical characters. It has lost its whiteness and its opacity, and become of a light yellowish-brown colour and semi-transparent, assuming the aspect but not acquiring quite the hardness of a piece of dried tendon; at the same time it has become curled up at the corners. It feels very considerably harder than before. It

cut with a knife, it "cuts" something like slightly warm glue or like an old and somewhat hardened piece of candied orange-peel, which, on the whole, it rather resembles; at the same time it has notably diminished in size. In fact, the glycerine has almost completely deprived it of all its water, which has become diffused throughout the glycerine, while the glycerine itself has thereby become accurately applied to every nook and crevice of the piece of skin in the closest possible contact. In the living skin, of course, even when it is completely raw, desiccation of this kind does not take place on the application to it of glycerine, because the skin is constantly fed, on its under surface, by an inexhaustible supply of aqueous fluid; but it is clear that an agent which has so obvious a capacity for absorbing watery fluids into its substance must be far more capable of bringing medicaments already dissolved in it into much closer juxtaposition with a serum-secreting surface of skin than it is at all possible to attain by applying to the skin the same medicaments incorporated with grease, whether in the shape of lard or oil. Grease of any kind, so far from absorbing watery fluids into its substance, is proverbial for resenting any attempts at its admixture with them. "But, then," it might be urged, "why not use water? water surely is miscible enough with aqueous solutions; whether serous or other, the process of osmosis would surely convey the water, and with it the medicament it may contain, into the substance of the viscid film of serum, and so to the surface of the skin itself." This is true; but then, as I have said before, desiccation rapidly takes place, both of the lotion and of the serum, and so an impermeable film of dried scab becomes (fatally to the purpose in view) interposed between the skin and the remedy. "Then, why not," it might be urged, "cover the lotion applied on rag with a piece of oiled silk? *that* would prevent desiccation." To this the reply is simple—the experiment has been tried often enough, and I have had frequent occasion to note the result: such a plan invariably aggravates the disease very markedly; and more than that. For example, if the patch of wet rag and oiled silk be larger than the patch of disease over which it is applied, it leads rapidly to an extension of the disease. Thus, I have often seen a large round patch of chronic eczema very speedily converted into a much larger square patch, the size and shape of the larger patch corresponding very accurately to the dimensions of the piece of oil-silk which had been kept applied. The skin becomes thoroughly macerated; and this condition evidently is more prejudicial to a favourable issue in chronic eczema than even its condition as it exists when it is left to itself. Unlike a mere aqueous solution, a solution of the remedy in glycerine permits of its continuous application, while at the same time the skin is preserved supple and *moderately* moist. Unlike an aqueous solution, reinforced by a covering of oil-silk, a solution in glycerine permits of a certain degree of continuous evaporation from its surface of aqueous vapour. In short, glycerine appears to have the property of supplying efficiently the most important of the physiological actions of the lost epidermis—namely, of conducting in like manner with the epidermis the business of the "insensible perspiration." When spread out in a film on the raw skin, it fulfils the same office that the epidermis does, in continuously absorbing water on its under surface, and permitting its constant escape from its upper surface in the shape of aqueous vapour, but in such moderate quantity as shall serve to keep the skin itself fairly and properly moist. In addition to this useful quality may be added another. Very many patients have an extreme dislike to being smeared over any considerable portion of their surface with grease of any kind; not only does it make their clothes in a mess—which to a person of cleanly habits is often extremely distasteful—but it induces a peculiarly uncomfortable sensation which is a source of annoyance. Whereas glycerine, even when applied freely over the greater portion of the entire surface, is a comparatively cleanly application, and excites no other sensation than a feeling of slight stickiness, which is far more readily put up with, and is eagerly preferred to the unpleasantness of a general inunction. Even this slight disadvantage completely disappears when, as should always be the case, the glycerole is not *profusely* applied, but is smeared on in very moderate quantity at each

application, and renewed as often as may be demanded—generally about three times a day.

[After some further remarks Dr. Squire describes the pharmaceutical details.]

The remedy is manufactured—or rather, I should say, the stock which forms the basis from which the remedy is prescribed is made—in precisely the same way as the "plumbi subacetatis liquor" of the British Pharmacopœia, only that glycerine is used in its manufacture instead of water; and to this I have to add that some simple directions as to temperature have also to be followed. It is thus prepared: Take of acetate of lead, 5; litharge, 3½; glycerine, 20. Heat for half an hour in a boiling glycerine bath, constantly stirring, and filter in a gas-oven or other kind of heated compartment. The result is a perfectly clear and colourless liquid, of a somewhat more viscid consistency than pure glycerine. Physically, it is a stronger solution than the Pharmacopœia "plumbi subacetatis liquor," inasmuch as the insoluble white residue left by the Pharmacopœial process is nearly double by weight the residue left by the process above directed. Therapeutically, however, the glycerine preparation is a far less active application considered absolutely than the "liquor," besides that it differs markedly in several essential respects in the *kind* of effect produced by it. It does not appear to be known that equal strengths of solution in water on the one hand, and in glycerine on the other, of any remedy used locally, are very different as to the degree of effect exerted on the skin, the aqueous solution being in every case a far stronger application than the glycerine solution. The reason of this is very obvious: the rapid evaporation of the water under the influence of the heat of the body very soon concentrates the aqueous solution; whereas the comparatively fixed character of glycerine does not allow of any notable evaporation of the solution.

Two of the pharmaceutical details of the preparation of the glycerole demand a little explanation. The ingredients are not directed to be boiled over a naked flame, because, in boiling, glycerine undergoes decomposition, evolving acid fumes. On the other hand, they are not directed to be heated in a boiling-water bath, because, when thus warmed, less of the powder is dissolved than when they are heated in a boiling-glycerine bath.

Filtration in a hot chamber is recommended, because at the ordinary temperature it would probably take about a week to filter even a small quantity of the solution, whereas when heated the solution temporarily loses its viscidity, and speedily runs through the filtering paper.

I have called the preparation I have above described the "stock" from which the remedy is prescribed, because as above prepared it is far too strong for general use, although it may occasionally, in certain cases, after one's way has been carefully felt by the previous use of milder strengths of solution, be with advantage used undiluted. I find that a drachm of it to the ounce of pure glycerine is about the strength which is usually expedient. Sometimes half a drachm to the ounce is quite sufficient. On the other hand, two drachms to the ounce will sufficiently often produce a better effect than one drachm to the ounce will; and greater strengths progressively employed up to the full strength will more rarely be found expedient. The skilful use of this remedy, simple as is its composition, is like the skilful use of a very simple instrument. Some people can achieve wonders in wood-carving with a penknife: some cannot. To determine at sight what conditions are favourable to its employment, and what are not, is one matter; to pronounce what strength of it should be used is another, and perhaps a less easy affair, but it is of no less importance as concerns the result. Too weak an application will do scarcely the least good: too strong a one will do positive harm. Practical experience in the use of the remedy will alone suffice to impart judgment in these matters. But these remarks apply with equal force to every local application of any kind that may be employed in the treatment of skin diseases. I introduce them here merely to explain why I believe that any attempt at minuter detail than I have already entered into on this head would probably be an idle one.—*Medical Times and Gazette*, *March* 18 *and* 25, 1876, *pp.* 302, 329.

76.—ON GLYCEROLE OF SUBACETATE OF LEAD IN CHRONIC ECZEMA.

By Dr. J. Hancocke Wathen, Fishguard.

[Referring to Dr. Squire's interesting papers on this subject, given in the preceding article, Dr. Wathen says that his father and himself had been in the habit of using lead in the form of an ointment made with the subacetate liquor, in chronic eczema as well as other skin affections, for the last thirty-five years. He then goes on to say:—]

Dr. Squire has dealt so thoroughly with the subject that hardly anything remains for me to add, beyond offering my hearty testimony to the efficacy of the treatment he advocates. There are, however, some points of pharmaceutical difference between us which require notice, and, if not too wearying to my readers, I will describe the mode of preparing the ointment as we have generally used it.

After discussing the value of lead ointment made with the subacetate liquor and lard, Dr. Squire announced his preference for the combination of the liquor with glycerine. Of this combination alone I have no experience, as the preparation we use is that of lard, glycerine, and the subacetate liquor, which is prepared in the following manner:—Into one ounce of best clarified lard two or three drachms of glycerine is rubbed. After this has been incorporated the addition of the liquor is commenced; the lead is rubbed in until the lard becomes saturated and will not receive any more. In the manner and care with which this is done consists the whole secret of the success of this preparation.

If great care be taken to coax and tease the liquor plumbi in, as much as one ounce of the latter can be incorporated with the lard before it becomes saturated. This strength is at variance with what Dr. Squire states as the maximum amount of the liquor—viz., one drachm—that can be mixed with the lard. This may possibly be accounted for by the presence of the glycerine, which should be added *before* the liquor, as, if it (the glycerine) be mixed *after* the addition of the lead, the latter will all be driven out. As I have written above, much depends on the patience exhibited in rubbing in the liquor. By pressing and lifting the spatula from the surface of the lard, a number of cells are produced; over these the lead is poured, and gently rubbed in with the lightest of hands, and with a little skill a full fluid-ounce of the liquor should be taken up by a similar weight of lard. Some lards take up more than others; and the weather has an influence: if the weather be cold and frosty, the lard will take up a proportionately smaller quantity.

In the various states of chronic eczema of the moist type, as defined by Dr. Balmanno Squire in his paper, the above ointment has been found of the highest value after other treatment has signally failed. While, on the one hand (as Dr. Squire has already pointed out), by the application of Goulard's lotion to an eczematous surface the diseased action can be extended *ad infinitum;* on the other, by the use of the ung. plumbi subacetatis (liquor), or (according to Dr. Squire) by the glycerole of the subacetate of lead, we have an expeditious and efficacious method of curing these eczematous affections. In applying it to the limbs, the better method is by spreading a number of strips of bandage with the ointment, and using the strips after the many-tailed plan. This gives support to the congested bloodvessels, and insures more perfect contact of the ointment with the diseased surfaces. I can thoroughly endorse Dr. Squire's statement as to the freedom from risk of lead-poisoning. Never has a single case occurred to me of the faintest suspicion of absorption of the lead into the system, although a considerable amount of surface has been enveloped in ointment—for instance, the whole of both legs, from knee down to the foot; and, unlike Dr. Squire's method, the application from one dressing to another is allowed to accumulate on the surface.

This ointment has been found of great service in relieving the suffering in *some forms* of pruritus, particularly that of the genitals and anus. Herpes *preputialis* has also given way to this remedy.

Were it not for fear of occupying too much space and becoming tedious, numerous cases could be cited of the above troubles which have rapidly yielded to the application of lead.

I have just learnt from my friend Staff-Surgeon E. Higgon Evans, R.N., that the form of ointment I have described has been used in that service with admirable results.—*Med. Times and Gazette, April* 29, 1876, *p.* 464.

77.—THE TREATMENT OF SCROFULIDES (LUPUS).

By Dr. HENRY G. PIFFARD, Professor of Dermatology, University of the City of New York.

[Lupus, in its usual varieties, is undoubtedly a scrofulous affection. Its treatment by the internal administration of arsenic is generally merely so much lost time.]

If we remember that the natural tendency of these affections is to extend indefinitely, and almost invariably to leave cicatrices, the indications for treatment are perfectly plain; namely, to check the spread of the eruption, and to cure the existing lesion with the least possible scarring. The details of treatment will vary with the particular variety under notice, and will be considered in the order in which they have been given.

Treatment of the Erythematous and Corneous Scrofulides (*Lupus Erythematous*).—Kaposi recommends frequent frictions with the *spts. saponatus kalinus*, and states that he has thus caused the lesion to disappear without leaving the slightest trace. I have had the same happy result follow the use of glacial acetic acid applied bi- or tri-weekly. Both of these applications act superficially and without producing an eschar, and seem to effect their purpose by causing absorption. I have likewise had excellent results follow repeated and energetic frictions with the following:—℞ Saponis viridis, oz. viij. Glycerini. Olei cadini. aa. oz. ij. Ol. rosarum. q.s. M.

These preparations should be used in preference to stronger caustics, which, destroying tissue, would necessarily be followed by a cicatrix. The only objection to this treatment is the length of time required. In a few more fortunate instances a cure may result in a few weeks from twenty or thirty of the frictions, or applications of the acid, but commonly their use must be prolonged for several months. These means are admirably adapted to recent patches, and may result, as observed by Kaposi and myself, in perfect cure. If, however, the eruption has already existed for some time, and portions of it, especially the central and older parts, begin to exhibit atrophic changes, it will be vain to hope for recovery without cicatrix. Under these circumstances the centre of the lesion may be left to take care of itself, and attention be confined to the periphery; that is, to the advancing border. If the preparations spoken of do not appear to act with sufficient vigour, the pure sapo viridis (sapo viridis, or green soap, so much used in Germany, is composed of spermaceti, lb. ij.; sol. of hydrate of potash (sp. gr. 1.33), lb. j.) may be substituted for them, applied daily with friction, or spread upon a piece of linen and left in contact with the parts for several hours. If the green soap cannot be readily obtained, a solution of caustic potassa, 25 per cent. to 50 per cent., may be used instead, applied once a week or at more distant intervals according to the effect produced. The acetic acid and sol. of potash are usually applied with a camel's-hair brush or a glass rod. Both of these methods, however, are objectionable, as they are apt to deliver an excess of the fluid, which runs over and injures healthy parts. A much better way is to employ a small hard-rubber probe around the end of which a little cotton-wool has been wrapped. Stronger caustics than these mentioned are rarely required, unless speedy destruction of the lesion is necessary; in which case *potassa cum calce* or chloride of zinc may be employed. When the lesion is small and its early extinction desired, I prefer removing it (*ægroto volente*) by excision.

Dubina, and more recently Volkmann, prefers to remove the infiltration by

means of hundreds of fine punctiform scarifications. These are made with a small sharp-pointed knife to the depth of 2 millimètres. The punctured spots should be covered with lint well pressed on, to stop the bleeding, and left attached until it falls spontaneously. The operation should be repeated in from two to four weeks, from three to eight operations being usually sufficient. Volkmann says that no scarring results from the treatment. I have had no personal experience with this method in the erythematous scrofulide, but have used a modification of it in the next variety.

Treatment of the Pustular Scrofulide.—The local treatment of this variety is quite simple. As scarring is inevitable, we may attack the lesion with some vigour. If it be in an early stage, without much ulceration, I have had good results from linear scarifications followed by green soap. When, however, there was considerable ulceration, it was formerly my custom to make a few superficial cauterisations with the liq. hydrarg. nitratis, followed by the application of a mercurial ointment (usually the proto-iodide ten grains to the ounce). Neligan and Weisse have used with advantage the acetate of zinc. In this way the ulceration may sometimes be coaxed to heal, but the process is tedious, and the resulting cicatrix often unstable. Latterly I am inclined to prefer more rapid and energetic measures, such as thorough cauterisation with the chloride of zinc. The chloride exposed to the air until it has sufficiently deliquesced is applied to the ulcer in a thin layer by means of a platinum spatula. It is then covered with a piece of lint cut to fit the part, and the whole left to itself until the eschar falls, which may not occur for a week or ten days. Upon removal of the crust healthy granulations will usually be apparent (and sometimes complete cicatrisation), but if not the cauterisation must be repeated. In case the floor of the original is covered with large, uneven, and papillomatous granulations (*verrucous form*), it is best to remove them by thorough scraping with the "sharp spoon," an instrument specially recommended in this connection by Volkmann. It is also well to give the edges a good scraping with the spoon. The morbid tissue yields more readily than the healthy, and a considerable portion of the disease may be thus removed mechanically. When a somewhat level surface has been obtained, apply the zinc in the manner described, and, after the fall of the crust, repeat the operation if necessary.

Treatment of the Tubercular Scrofulide without Ulceration, or with Superficial Ulceration.—If ulceration has not yet occurred, we have several methods of treatment from which to choose. The indications are to check the spread of the lesion, and to do so with the least scarring. Excision may be practised, and is to be preferred if the lesion is limited and there is sufficient extensibility of the surrounding skin to permit of coaptation of the edges of the wound, so that we may hope for a linear cicatrix. If the lesion is small and quite superficial, it may be readily removed with the skin-grafting scissors. Excision to be effectual must be thorough, both as to depth and extent. As the morbid deposit in this variety rarely extends beneath the subcutaneous tissue, and usually ceases at the lower part of the corium, no difficulty will be experienced in this direction; but the infiltration is apt to extend laterally for some distance beyond the points at which the disease is evident, and consequently the incisions should be made at least two or three millimetres beyond the apparent limit of the lesion; otherwise a speedy return of the trouble may be anticipated. If the situation of the disease or the condition of the parts renders excision undesirable, the tubercles may be destroyed with nitrate of silver. This method is largely practised in Vienna, and consists in boring into the diseased tissue with a sharpened point of fused nitrate. The points of silver prepared by Squibb, to which he adds a little chloride, to make them harder, are admirably adapted to this purpose. Many of the tubercles, or rather papules, are quite small, and boring into them with the ordinary caustic points inflicts unnecessary pain and injury upon the adjacent healthy tissues. To obviate this, I have for several years used a probe made of irido-platinum. The point of the needle is dipped in fused nitrate (Squibb's is better for this purpose than the pure), a thin layer of which immediately congeals around it. As soon as it is cold, a second or a third dipping will increase the deposit of silver sufficiently. With these

needles quite small punctures may be made, and are less painful than those made with the ordinary silver stick. If the irido-platinum needles are not at hand, ordinary straight surgeon's needles may be used, but are not so convenient and are soon destroyed. Actual or galvano-cautery may be employed, but possess no advantages over simpler measures, except the opportunity they afford for display.

Lastly, the disease may be destroyed by means of arsenical paste. Hebra speaks of this method so enthusiastically that I shall give his description in full. The formula employed is :—R. Acidi arseniosi, gr. xx.; cinnabaris, dr. j; ung. rosæ, oz. j. M. The paste should be thinly spread upon linen, which is cut in narrow strips and accurately applied to the affected part. It is then covered with lint and held firmly in place with adhesive plaster. It is left in position for twenty-four hours, when a fresh application is made without previous washing. At the end of another twenty-four hours it is again applied. During the first day the parts to which the application has been made present very little alteration and are not very painful. At the end of the second day of treatment, however, the pain increases, and when the plaster is removed the tubercles are found to have a greyish colour and macerated aspect. After the third application the pain becomes still more severe, and the integument surrounding the lupous patch becomes the seat of considerable œdema. On removing the plaster at the end of the third day, all the tubercles, both large and small, are found reduced to the condition of a brownish-black eschar, and covered with a thin pus. The eschars correspond to each tubercle, and are sharply defined by the intervening healthy skin. The pain ceases quickly and completely, and the œdema disappears in two or three days. The great advantage of this arsenical paste consists in its not injuring or even excoriating the healthy skin, while the morbid tissue is safely and thoroughly destroyed.

The little sloughs, which are as numerous as the pre-existing tubercles, are loosened by suppuration, and removed in five or six days, leaving small holes separated from each other by islets of healthy skin. Cicatrisation is rapid, and the resulting scar not very noticeable.

Sometimes two applications are sufficient; or again, if the tubercles are large and covered with thick epidermis, two or more courses may be necessary. Arsenical poisoning has not occurred in any of the hundreds of cases treated by Hebra in this manner.

If the tubercles have already *ulcerated*, they may sometimes be coaxed to heal, as already stated, by stimulating applications of acetate of zinc and the like; but it is better to excise, subject to the restrictions above noticed. If incision is contra-indicated, the ulcer and its margin may be well scraped with the sharp spoon, and then cauterised with the chloride of zinc, or a mixture of equal parts of caustic lime and caustic potash made into a paste with absolute alcohol. The fall of the slough will usually reveal a healthy ulcer with a tendency to heal. I much prefer the caustics to the simply stimulating applications, as the latter have in my hands more frequently produced an effect opposite to the one desired.

In the *hypertrophic* form, excision when convenient, or destruction by the actual or galvano-cautery or by electrolytic needles, seems to be the most reliable method; but never having had this variety under treatment, I cannot speak from personal experience.

Treatment of the Tubercular Scrofulide with deep Ulceration.—This form demands the most prompt and energetic treatment. In the previous varieties it was at most a question of disfigurement, but in this it is a question of life and death, for if the destructive processes are not checked, a fatal result is by no means rare. In this condition there is but one method to be relied upon, and this is excision followed by cauterisation. In recent cases this presents no difficulty; but when the disease has already advanced to a considerable extent, and the bones have commenced to suffer, the indications are not so easy of fulfilment. These cases were formerly regarded as incurable, and active measures were not recommended. Mr. Moore, however, in his admirable monograph upon *rodent cancer* as he terms the affection, has demonstrated *the possibility* of curing cases characterised by a very extensive

destruction of deep tissues, cases which would usually be regarded as hopeless. His plan consists in removing the diseased parts as thoroughly as possible with the knife, and afterwards applying a layer of deliquesced chloride of zinc. The wound is then packed with cotton-wool, which is left in position till thrown off by suppuration and the formation of healthy granulations. Plastic operations may then be employed to remedy the deformity.

Treatment of the Phlegmonous Scrofulide.—In the early stages and before suppuration has occurred, the nodules may sometimes be caused to disappear by the employment of frequent frictions with the ungt. iodi or ungt. potassi iodidi; but if they have already softened and contain pus, this should be removed by a fine puncture and suction with a hypodermic syringe, with the subsequent instillation of a drop or two of iodine. This is much better than the free incision recommended by some, and is also better than leaving the lesion to take its own course, as in the latter case considerable scarring is inevitable. If the abscess has already opened and an ulcer formed, it should be freely stimulated and perhaps cauterised with some of the agents already mentioned.

Lupus in its several varieties is far from being the intractable disease it was formerly considered, and, when properly managed, is in the majority of cases perfectly curable. It is only a question of time, patience, and the judicious selection of remedial agents adapted to the particular case under consideration.—*Practitioner, Dec.* 1875, *p.* 415.

78.—THE TREATMENT OF PSORIASIS BY INDIA-RUBBER UNDERCLOTHING.

By Dr. BALMANNO SQUIRE, Surgeon to the British Hospital for Diseases of the Skin.

[Tar administered internally is no assistance to outward tar in the treatment of psoriasis. This was shown by Mr. Squire in a paper previously published. In the present paper he relates two cases treated by an agent of a different sort.]

Case 1.—A woman, aged 30, had been affected with chronic psoriasis in a moderate degree for 20 years, and, in addition to this, had for the past five weeks been the subject of an acute general attack of guttate psoriasis, which freely occupied every part of the skin, with the exception only of the fingers and the palms of the hand, and the toes and soles of the feet, but most copiously the front and inner surfaces of the thighs, the lower half of the abdomen, the loins, and the front of the legs and the back of the forearms. On February 1st, 1876, she commenced wearing a complete suit of vulcanised India-rubber underclothing, together with an oilskin cap, washing herself daily all over with warm soap and water. On February 8th, the scaliness, the thickening, and redness of the skin at the spots had quite gone, and the eruption consisted merely of faded yellow stains, with the exception of a few spots on the legs. On February 12th, the stains had become much fainter, those on the forearms requiring to be looked at "across the light," in order to make them out.

Case 2.—A girl, aged 18, had been affected with chronic psoriasis for twelve months. The eruption was scattered in patches of varying size over the trunk and limbs (the larger patches occupying the front and outer surface of the lower part of the thighs and the front of the upper part of the legs and the back surfaces of the forearms and lower part of the arms), and on the scalp. On February 1st, 1876, she was clothed like Case 1, and washed herself daily in the same way. On February 8th, half the patches had disappeared, leaving only faint yellow stains. All the others had in part disappeared, some (for example, the two largest patches situate on the knees) having become only broken rings, which, a week before, had been large, filled in, figurate patches. On February 12th, quite three-fourths of

the whole number of patches had disappeared, and the vestiges of the remaining fourth had become still scantier.

Remarks.—The device is not my own, but that of Dr. Colson of Beauvais. Experiments of this kind have since been pursued by Dr. McCall Anderson of Glasgow, Drs. Hardy, Lailler, and Besnier of the Hopital St. Louis, Paris, and Dr. Hebra of the General Hospital, Vienna. No distress is produced by this kind of underclothing, nor, indeed, inconvenience of any kind, save only that, if the wearer exert himself or herself at all actively, a moderately profuse perspiration is the result.—*Brit. Med. Journal, Feb.* 19, 1876, *p.* 217.

79.—ON A MORE EFFECTUAL METHOD OF APPLYING IODINE TO THE INTERIOR OF CERTAIN CYSTS.

By Furneaux Jordan, Esq., Surgeon to the Queen's Hospital, Birmingham.

I have found that there are in practice two classes of scrotal hydroceles, in which the ordinary methods of treatment are either difficult to use or uncertain in their result. In boys and men there are occasionally encysted hydroceles of the testis, or the cord, which continue to increase in size, or in which treatment is urgently requested. In such cases, except in early infancy, acupuncture or the use of a fine trocar often fails to cure. The walls of the cysts are usually thin, and collapse so much when their contents are withdrawn that the injection of a fluid is uncertain. The end of the canula may be outside the cyst, and the iodine solution be consequently injected into the connective tissue at its exterior. In such cases the following is a reliable method of treatment:—The cyst being well isolated, made tense, and brought near the surface, I pass through its centre a stout needle, armed with silk, and leave the threads hanging. The fluid quickly oozes away, especially if a little traction be made on the threads. I then, at one opening, wet the threads with iodine liniment (liniment because the quantity required is so limited) and draw the threads so as to leave moistened portions within the cyst. A little gentle friction will help to spread the iodine thoroughly over the lining membrane of the cavity. An hour later freshly moistened portions may again be drawn through if the cyst be large, or if other methods of treatment have failed. On the other hand, in a very small cyst a single thread, moistened and kept in one hour, will suffice.

Another class of cases are those of simple vaginal hydrocele, in which the injection of iodine and other ordinary methods of treatment are unsuccessful. An interesting case will best convey what I wish to say. A young man had a moderate-sized hydrocele. Trocar puncture, and acupuncture repeated a few times failed, and consequently iodine tincture (undiluted) was injected. In a few weeks the collection had reached its old size. A silver-wire seton was then put in; while in, the cyst remained empty, but its removal was followed by reappearance of the fluid. I then, at three o'clock, passed through the cavity a double silk thread at two spots. In a few minutes, when all the fluid had oozed out, I drew the threads, moistened with iodine liniment, into the serous cavity. I directed him to repeat the process in an hour. He was so anxious to get well—he was shortly to be married—that he moistened the threads four times in six hours. At midnight the effects had become so sharp that he was glad to remove the threads as he had been directed. He remained at home one day only, and was shortly and permanently well.

I venture to believe that no kind of hydrocele will resist this method of applying iodine, and consequently that the setting up of suppuration, even as a last resort, can rarely be necessary.—*Lancet, Jan.* 29, 1876, *p.* 170.

SYPHILITIC DISEASES.

80.—ON SYPHILIS.

By Dr. v. SIGMUND, Professor of Dermatology and Syphilis in the University of Vienna.

In this paper I have confined myself to the results of the clinical observation of facts during a tolerably long career spent in constant attendance on the Vienna General Hospital, and have not attempted to enter into histological questions.

Syphilis is a disease completely distinct and separate from all forms of gonorrhœa; on this point all observers are agreed. But there is a disease which is most frequently, and indeed almost exclusively, propagated by sexual intercourse, which is characterised by the appearance of an ulcer, usually, though not always, seated on the surface or mucous membrane, especially of the generative organs, or their immediate vicinity, and which, like gonorrhœa, is a *purely local* affection. In many cases, coincidently with the formation of pus in the ulcer, and sometimes with its confinement and burrowing in the connective tissue and skin, *inflammation arises in the lymphatic vessels and glands*, but in all instances it does so only in the neighbourhood of the ulcer, and always *in direct anatomical relation and connection with the seat of the ulcer*—never without this, never isolated or at a distance from it.

This inflammation runs its course *without* in any instance causing general disease of the organism. Thousands of cases have fallen under my notice in which I have been able to satisfy myself on this point by observations continued for years. Moreover, I have seen cases of repeated infection, and in one of our ablest soldiers, who died a hale old man at the age of 83, without offering *a trace* of constitutional syphilis, the infection was repeated as many as twenty-four times. Such ulcers constitute, it is well known, the subject of dispute between the so-called dualists and unicists. Nothing that has been adduced on either side is capable of absolutely deciding this question: clinicists must however maintain the dualism of the disease, until better grounds than those at present advanced for unicism have been discovered. The so-called venereal ulcers furnish inoculable pus which even in syphilitic patients always reproduces syphilis in all stages, phases, and forms, and these ulcers make their appearance in individuals who have never suffered from syphilis, just as upon those who have long suffered from it and now appear to be healthy. Undoubtedly under the general term ulcers, different forms of disease are included, as diphtheritic ulcers, contagious venereal ulcers, follicular ulcers, &c.; nor can there be any doubt that loss of substance of the skin, in all points similar to the so-called soft chancres, can be produced by the inoculation of simple pus. Precise histological as well as chemical and clinical researches will alone establish the fact of what I have just stated. All the attempts of the unicists to view these ulcers as different grades of a true venereal sore depending on the greater or less intensity of the syphilitic virus, are untenable on an unbiassed examination. The virus of syphilis has further the peculiarity that it is not simply communicated by contagion, but that it infects, *non contactu sed infectione sanguinis et nutritionis totius organismi agit.* And a poisoning of the blood and consecutively of the nutrition of the body at large, syphilis is, and remains, from its first germination at the point of contagion to its passage into the lymphatics, and from thence into the blood vascular system, until finally it passes from the defined forms which it assumes in various systems and organs, into the ultimate syphilis-cachexia. That the germ of syphilis does not produce in every one who may be affected, *all* the well-known series of symptoms indicative of such morbid phenomena is a remarkable fact; but this is explicable if the *individual* attacks are studied carefully and for a sufficient length of time. *For example*, I have directed the attention of my pupils for years to the com-

paratively mild course of syphilis in the menstruating woman, but I have demonstrated many other causes of such a mild course, which all point to the fact that its course is simpler or milder when we strive to preserve the several physiological junctions as far a possible in a healthy state, to remove all causes of disturbance, and moderately to increase the secretions and excretions, whilst as far as possible we prescribe a complete system of hygiene and dietetics, along with mercury or the iodides. That the *former* in the earlier stage (up to the papulur eruption) is only rarely and exceptionally applied as a general remedy has often enough been seen in my clinical practice.

Now there is still another point, viz., the inoculability of syphilis. If we were going to speak of experiments on this point, the mere methods of performing them would require special attention and criticism, and observations of their results and conclusions founded upon them would do so still more. But we will pass them over and consider accidental inoculations, in regard to which the following facts have occurred to me. So-called primary and secondary syphilis is inoculable: upon this point all are agreed. The gumma too, and, I repeat, the substance of the gumma as well as the blood taken from the gumma, is also inoculable. This is associated with the fact that gummous mothers bear children which do not at first appear syphilitic; but often, no doubt, distinct though perhaps not glaringly palpable evidences of the disease are overlooked during the first years of life. These children subsequently present unquestionable gummatous forms of syphilis. Let not the dogmatists be too hastily misled by the still more hasty critics. I venture to give this warning to those who believe the question to be decided as to whether father or mother gave congenital syphilis. I have never succeeded in recognising true syphilis in a child in which the uterus that bore it was not also syphilitic. But unfortunately I know many, many cases in which the uterus, on *scrupulous examination and protracted observation*, was found to be diseased in women considered to be healthy so far as syphilis was concerned, and where the syphilis in the child had been attributed to the semen of the father.

When trouble and time were taken to investigate carefully and for sufficiently long periods all the organs and systems of the body, it was found that besides general syphilis of the lymphatic glands, very frequently obstinate necrobiosis of the epithelium and of the corium existed in the cervix uteri, in the tonsils, the pharynx, &c., as well as extremely slight annular syphilides of the skin, very delicately marked psoriasis, &c. Time forbids me to enter further in this paper on the subject of the local and general disturbances of the blood-forming organs, and of the nutrition of the body, which occur in such persons.

But the whole chapter of this so-called latent syphilis (*latet illum qui non noscit*) is of the utmost interest to every practitioner who does not consider his whole duty to consist in paying attention merely to one form of the disease or to a few short moments in the life of the individual.

When more than twenty-five years ago (in complete accordance with my honoured guide Virchow) I declared syphilis to be a disease essentially affecting the whole lymphatic system, I had carefully studied the question of the extension of syphilis germs in not a few individuals. In perfect accordance with Virchow I have always regarded syphilis in all its stages as a disease which has its origin in new cell-growth, which cell-growth is incapable of becoming vitalised and soon passes into organic misformations and degeneration of various kinds. On this account I have also called it "trophic disease." It is for this reason also that in my clinical work I constantly inspect and examine the *whole* body. Nothing is more prejudicial to a thorough pathology of syphilis than to regard it as a skin disease, because many things are more readily observed on the skin than elsewhere *in primo introitu*. *Lenitius novit qui penitius pervestigavit.* Even at that time I directed the attention of the profession to this characteristic mode of extension *as the most constant type of the disease.* Look at the most recent histological researches, and if you inquire without prejudice you will see that from the simplest cell-infiltration to the gumma according to the mode of the origin and *extension it will always* be found that first the lymphatic vessels, then

the most delicate capillaries of the blood-vascular system, and ultimately the lymph and blood themselves, form the carriers of disease. This fact affords as complete an explanation even of the gummatous disease of the vessels in syphilis of the brain as it does of the origin of these minute gummatous nodules and nodes in the male organs of generation, which often become very hard in chronic cases of syphilis, and are then regarded as cases of re-infection and of new syphilitic infiltration of a foreign nature.

We have recently seen hard nodules of this description in the labia majora of a woman, who also presented similar gummata of cartilaginous hardness upon the body.

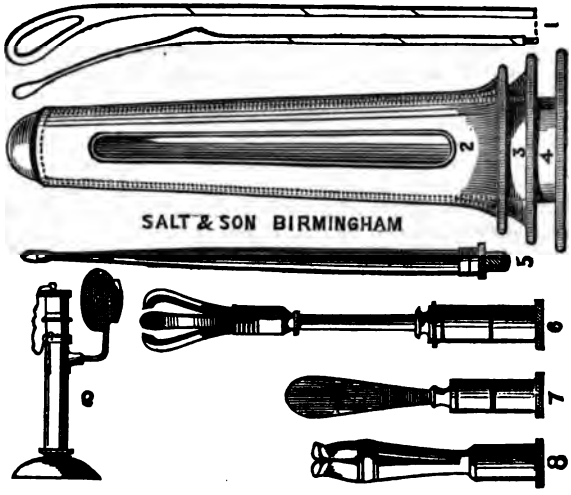
Now it is well to discuss the subject of syphilis, since science and humanity can only benefit from such discussion. Let all personal motives be thrown aside; one thing comes out clearly from these discussions. Public instruction has still a very important duty to fulfil in regard to medical science. Special classes for the clinical study of syphilis ought to be formed everywhere, and practitioners should everywhere be instructed in them in such a manner that they should be made to diagnose, even if they are not always made to treat, all forms of the disease. I need hardly observe that thereby the most effectual barrier would be erected against the ignorance, arrogance, and charlatanry that prevail in this much dishonoured region of scientific and social hygiene.—*Practitioner, March* 1876, *p.* 191.

MIDWIFERY,

AND THE DISEASES OF WOMEN AND CHILDREN.

81.—NEW SPECULUM VAGINÆ.

We have examined the new speculum of Messrs. Salt and Son, of Birmingham, and find it a compact and convenient instrument. The novelty and utility of this invention consist in the economising of space, by arranging for the supply of a number of instruments in constant request by the obstetrician, without any increase in the bulk of the speculum. All the instruments illustrated below (except the lamp) are contained within the introductory plug, hereafter described.



The speculum consists of two tapered metal tubes (Nos. 2 and 3), highly polished for reflection, fitting the one within the other, and capable of being used independently; thus forming two specula of consecutive sizes. Both have a lateral opening, as seen in the engraving; the inner one may, by rotation, close the lateral opening wholly or in part, so that any desired surface of the vaginal walls can be exposed for inspection or operation. The plug (No. 4) fits accurately the inner speculum, and has its end "coned," to facilitate introduction. It is closed at its larger extremity by a movable metal cap, which serves as a reflector for a candle-lamp. The complete speculum is contained in a neat leather case, and occupies, with the following instruments, no more space than an ordinary Ferguson's speculum :—1. Simpson's sound, united by a screw or hinge-joint to a fenestrated elevator (No. 1). 2. Port-caustique, lancet, and sponge-holder (Nos. 6, 7, and 8), each fitting into a porcupine-quill handle of suitable length (No. 5). 3. Candle-lamp and reflector *(No. 9)*. 4. Sponge and laminaria tents.—*Lancet*, Feb. 28, 1876.

82.—ON THE INDUCTION OF PREMATURE LABOUR.

By Dr. CLEMENT GODSON, Assistant Physician-Accoucheur to St. Bartholomew's Hospital.

[After considering the reasons for having recourse to the induction of premature labour, the author of this paper passes on to the consideration of the various plans which have been proposed for its performance.]

First, let me enumerate them in succession, and then discuss them separately—

1. Evacuation of the liquor amnii by puncturing the membranes.
2. The administration of certain drugs, particularly ergot of rye.
3. The injection of water into the vagina.
4. The injection of water within the uterus.
5. The injection of atmospheric air or carbonic acid within the uterus.
6. Galvanism.
7. Irritation of the mammæ, by means of cupping-glasses.
8. Separation of the membranes from the uterine wall, as far as is practicable, with the finger.
9. Insertion of a long gum-elastic catheter between the membranes and the wall of the uterus.
10. Dilatation of the vagina by means of air-bags.
11. Dilatation of the os uteri by air-bags.
12. Dilatation of the os uteri by means of sponge tents.

1. The old method of puncturing the membranes is still in favour with a great many. I must say that I am strongly opposed to it as a rule. I perfectly agree with what Baudelocque says when arguing against induction of labour. It is the *plan*, however, which he condemns. Probably, had that been known to him of dilatation by sponge tents, his opinion would have been very different.

He says, "If we break the membranes before the orifice of the uterus be sufficiently open for the passage of the child, and the action of that viscus strong enough to expel it, the pains will go off in the same manner for a time, and the labour afterwards will be very long and very fatiguing; the child, deprived of the waters which protected it from the action of the uterus, being then immediately pressed by that organ, will be a victim to its action before things be favourably disposed to its exit, and the fruit of so much labour and anxiety will be lost." What reasoning can be more sensible than this?

And yet, in the British Medical Journal, during the last few months, a Medical Practitioner in Cornwall has been attempting, in a series of letters, to run down the sponge method, most ably advocated in a paper by Dr. Swayne, of Clifton, and claim superiority for the plan of evacuating the liquor amnii, his whole experience of which is confined to a single case occurring in his practice, which happened to result satisfactorily, just as one hears of the waters breaking in the street, and the child being almost born before the patient could reach her house. But, I ask, is it a matter of congratulation, as a rule, when one finds that the membranes have ruptured before the os uteri has hardly commenced to dilate? Does not experience tell us that the consequence, generally, is a long, tedious labour?

2. The system of administering ergot of rye as a means of bringing on labour prematurely has two great objections. First, it is excessively uncertain in its action; my experience is, that it acts much better in increasing the uterine contractions which have already commenced, while most frequently it fails entirely to start them, even when enormous doses have been given. And it is believed that the drug, taken in large quantities, exerts a direful influence upon the fœtus in utero. I think, therefore, that it should never be employed as the *sole* means of inducing labour.

3. The injection of water into the vagina. This has been employed at a temperature of from 95° to 100° F. for half an hour at a time, the douche *directed* against the os uteri every four or five hours. The late Dr. Tyler *Smith* recommends hot and cold water alternately. Dr. Barnes says the *vaginal douche* takes one, two, or more days, and is liable to cause congestion

of the lower segment of the uterus. For my own part, the inconveniences of the application, and the uncertainty of its action, would preclude my ever having recourse to it.

4. The injection of warm water within the uterus, which is known as Kiwisch's plan, was introduced by Schweighauser in 1825. Cohein, of Hamburg, in 1846, used it with creosote added. Numerous successful cases have been published; but there is one objection to it, which should prevent its ever being again attempted. It places the life of the mother in jeopardy. Lazzati has collected 36 cases in which it was employed, and of these 12 mothers died. Surely no stronger evidence against it need be adduced. Considering that there should be almost perfect immunity to the life of the mother after other methods, no more need be said to utterly condemn the practice. But Tyler Smith, in his Manual, strongly recommends it; and as this is popular among students, and very deservedly so, for the clear way in which the mechanism of labour is described, care must be taken not to accept his views upon this special subject before us. It has been demonstrated that the water may pass through the fallopian tubes into the peritoneal cavity; air may be injected into the uterine sinuses; the placenta may become detached; the uterus may be so distended as to become ruptured; or the patient may die from simple shock.

5. The same objections apply to the injection of carbonic acid or atmospheric air, though successful cases of the former have been published by Scanzoni, and of the latter by Sir James Simpson; but deaths from both have been recorded.

6. Galvanism was proposed by Herder in 1803, in order to excite uterine action; but it was not applied to the purpose which is before us till 1844, when Dr. Radford, of Manchester, commenced to employ it, and did so successfully in four cases. Sir James Simpson and Dr. Barnes have also, formerly, advocated it. Having so much more convenient a method at our disposal, I should never employ it, for it must be most objectionable to the patient and tedious to the medical attendant.

7. Scanzoni proposed, and tried, the effect of a sucking-pump to the mammæ for the space of two hours. He was successful in two cases: one required seven applications, the other but three. It seems to me a very uncertain and disagreeable method, and one likely to interfere with lactation subsequently, from the irritation to the breasts caused by it.

8. Separation of the membranes from the uterine wall, as far as can be reached with the finger, is a very simple method, and one which in some cases may probably be sufficient; but certainly in the majority of instances further means would have to be adopted. There can, however, be no objection to trying it.

9. Inserting a long gum-elastic catheter between the membranes and the wall of the uterus, and leaving it there, coiling up the end in the vagina, has been found very effectual, but certain objections have been raised to it. It is said that the placenta *may* be partially separated by it, and the membranes *may* be accidentally punctured while pressing it. These should be improbable consequences, and I believe it to be one of the best methods which we have; for, should it fail, it may be followed up by the insertion of sponge tents.

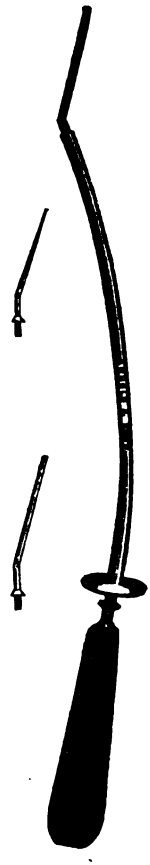
10. In America, the term "colpeurysis" is used to signify dilatation of the vagina, and a vulcanised gum-elastic bag called Braun's colpeurynter has been employed to dilate the vagina, with the view of setting up uterine action. While stretching the vagina, it is supposed to act also upon the os uteri, and Dr. Meigs says it is found that about four hours suffice to dilate the os uteri sufficiently to provoke good labour pains. I do not know that it has ever been carried into practice in this country.

11. Dilatation of the os uteri by elastic bags was proposed by Dr. Keiller, and has been brought prominently forward of late years by Dr. Barnes, who has introduced an improved form of bag for the purpose.

Speaking of the different methods for provoking the uterus into action, Dr. Barnes says, "Now, active labour may come to pass in twelve or twenty-four hours, or in two, three, four days, or even later. There is no certainty

about it. When labour comes, the child is expelled with little warning, almost suddenly, and before the medical attendant can be fetched. And it has to run the gauntlet of all those perils which especially surround premature labour unaided. It is just as feasible to make an appointment at any distance from home, to carry out at one sitting the induction of labour, as it is to cut for the stone." Dr. Barnes puts in an elastic bougie over-night, which, he says, gives rise to uterine action; next day he introduces his bags. Uterine action has been set up by the bougie; in other words, labour has commenced; why then interfere with a process which, started artificially, may be completed gradually by the efforts of nature? If this argument of carrying out the process of labour "at one sitting, as one would cut for stone," applies in premature labour, why should it not in labour at full term? If not likely to be followed by evil consequences, it would be a great boon to the medical attendant. To be kept about by a patient whom one has found in the first stage of labour is extremely trying. How much time and annoyance would be saved if we could proceed at once to "carry out at the one sitting" the delivery! And I cannot see why it should apply in one case more than in the other. Barnes's bags are of the utmost value when it is desirable to complete the labour in as short a time as possible—for instance, in puerperal convulsions; but in induction of premature labour, for causes not requiring hurry, to my mind their employment partakes too much of an operation, when there is no necessity for such discomfort to the patient.

Lastly, we have to consider the method of dilating the os uteri by means of sponge tents. It was proposed and put into practice with great success by Bruninghausen and Kiuge; Velpeau strongly advocated it; and finally, Sir James Simpson, who had tried a variety of means, adopted this in preference to any other. I am convinced, with him, that it is by far the most preferable. In 1872 I wrote a paper in the Lancet in favour of it, describing an instrument which I had designed for facilitating the introduction of the tent. Dr. Bedford, of New York, says, "It may be found extremely difficult, in consequence either of resistance or malposition of the os, to introduce the sponge, and the abortive attempts made to accomplish the object may induce more or less irritation of the parts." I found also this difficulty, to overcome which I had the instrument made.



Quoting from my paper in the Lancet—

"The means I advocate operate by surely and safely coaxing the uterus into an action which only differs from natural labour in being artificially initiated, and which is maintained and completed, under all the conditions of labour spontaneously occurring at a corresponding stage of pregnancy. Each of the methods in general use is, according to my experience, more or less formidable, in virtue of the amount and the kind of the manipulation which it involves. Most of them are practised in such a manner as to force on too hurriedly the uterine contractions; and that which consists in the evacuation of the liquor amnii stands self-condemned, as depriving the womb, at the very outset, of the all-important dilator provided by nature.

"My mode of procedure consists in insinuating, night and morning, between the cervix uteri and the membranes, sponge tents of gradually increasing size; the first, and each succeeding one, being as large as the parts will admit. On removing each tent, and before replacing it by another, a warm douche, containing Condy's fluid, is administered. I have found the use of one, two, and three tents to be sufficient, and have never had occasion to employ more than four.

"The instrument by means of which the tent is placed in position is made for me by Messrs. Arnold, of West Smithfield. It is shown in the accompanying illustration, and will be found fully described in the Lancet of April 22, 1871.

"It entirely obviates the use of the speculum, and being provided with what is equivalent to a universal joint, it enables the tent to be pushed, without extraneous guidance, between the cervix and the membranes, taking of itself the readiest path presented to it. For the same reason the membranes run no risk of puncture. The tents themselves are short, rounded at the extremity, and perforated, to facilitate adaptation to the instrument.

"The apparatus, and the mode of its application, are so simple, and so free from inconvenience and danger, that its use causes in practice little or no anxiety on the part of the patient; and until labour sets in, she moves about without pain or inconvenience, regardless of the presence of the tent."

The plan was introduced by me at the City of London Lying-in Hospital in 1869, when I held the appointment of Surgeon-Accoucheur to that institution, and it is still carried on there by my successor, Dr. Burchell.—*St. Bartholomew's Hospital Reports*, 1875, *p.* 33.

83.—THE SURGICAL TREATMENT OF PROLAPSUS VAGINÆ.

By Dr. Thomas Savage, Surgeon to the Hospital for Women, Senior Surgeon to the Birmingham Lying-in Charity.

[After some preliminary remarks Dr. Savage relates two cases.]

The first of the two cases is that of Mrs. E., a private patient, aged 47 years. She had had five children and one miscarriage, the last child four years ago. Has suffered from bearing-down for years, but of late has been much worse in this respect. She had worn a pessary, a globular one, given to her by a medical man, who told her her womb came down. When first seen by me, the anterior vaginal wall was down, and there were some vascular growths round the meatus. These latter being very painful were excised, and chloride of zinc applied. Nitrate of silver was repeatedly used to the vaginal mucous membrane with considerable relief, it being very red and brawny. A further operation was recommended; no pessary could be borne; and after some months of no treatment at all, she came again, saying she would undergo any operation, as her distress continued to increase. She had been a widow for some years, and having to gain her own livelihood, had been compelled to stand very much. The vagina was very lax; there was a profuse yellowish white discharge, and the anterior vaginal wall was quite prolapsed, the projection of it below the meatus being very prominent. The uterus was lower down than normal. Under chloroform I excised a piece of the mucous membrane of the anterior vaginal wall, of the shape of a lozenge, each side being about one inch long; stitches were then passed through the centres of opposite sides, brought together and tied. This caused considerable contraction, and would give to the cicatrix a perfectly stellate character. A parallelogram of mucous membrane was then excised from each side of the vaginal wall, the upper parts being on a level with the meatus, and about one inch from the muco-cutaneous edge. The incisions were about an inch and a quarter in length and three-quarters in width. The opposite sides were brought together. I then pared the posterior commissure of the vulva to the extent of about three-quarters of an inch in width, but not so long as for an ordinary case of ruptured perineum, viz., about two inches in extent. And two deep silver wires were inserted to bring the sides in apposition. Quills were not used, as it was feared they might more likely cause sloughing, which was especially to be dreaded in this instance, with three other wounds in the vagina to be healed at the same time. The ordinary after treatment was adopted, and healing of the wounds readily occurred, making the woman, as regards the comfort and enjoyment of life, quite a different person. She was able to stand for a lengthened period and do her ordinary housework, without any pain or even inconvenience. She was frequently seen for some months afterwards, and the relief continued, promising to be permanent.

The second case, Mrs. G., æt. 49, had had eight children and two miscarriages, the last child seven years ago. Suffers from bearing down, and has worn a support. On examination, when she strains, a cystocele is formed; the os is ulcerated; the vagina is very capacious, and a rectocele comes down. She wears a ring pessary for a time. She was afterwards admitted as an in-patient, and after a short rest in bed, the effect of which was to give her some relief, I had her anæsthetised by ether, and removed a lozenge-shaped piece of mucous membrane, one inch and a half each side in extent, from the anterior vaginal wall, one point being close to the cervix, and the other close to the meatus, the opposite sides being simply brought together by three catgut interrupted sutures; then a triangle of mucous membrane, one inch each side in extent, with the base downwards, from the posterior vaginal wall, three catgut sutures being used to bring the opposite sides together. The posterior vulvar commissure was then vivified, as in ordinary perinæorrhaphy, and brought together with silver wires. The catgut in the front wound appeared to become absorbed, that in the posterior wall could be felt when she left the hospital.

The relief in this case was just as marked as in the preceding.

The cases to which these or similar operations are available, all having in view the contraction of the cavity of the vagina and its outlet, appear to be women who have passed the child-bearing age, in whom the vagina is capacious and lax, with either complete or partial cystocele, rectocele, or uterine prolapse; which may have been induced suddenly, as by a violent effort; or, as is most general, gradually, as by increased weight of the uterus, acting from above, and forcing the organ to descend, first stretching the utero-sacral ligaments; or, by loss of support from below, as the loss of the padding of fat round the vagina; or, by a ruptured perineum. Of course, it is presumed the patient has been previously subjected to rest in bed, which has given only a temporary relief. In a few cases, I believe, rest in bed has a directly curative effect. Dr. Matthews Duncan has gone so far as to say that a ruptured perineum has very little effect, if any, in favouring the descent of the uterus. Madame Boivin speaks of the utero-sacral ligaments as the chief uterine supports, and this is confirmed by the experiments of Dr. Henry Savage, who found, on making traction on the uterus in a dead body, that these ligaments were the first to be put on the stretch. Most other authorities agree to this conclusion. The utero-sacral ligaments are described as the "two horns of a crescentic muscular emanation from the back part of the uterine cervix and platysma, with additional fibres from its vaginal attachments to each cornu." But, on the other hand, if the vaginal walls, when in normal relation and tone, are in apposition, and act as a column of support to the uterus, it would follow that to alter or destroy this column, as is done when the vagina is lax or the perineum gone, would give the uterus much more freedom to descend, and put greater tension upon the ligaments. Dr. Savage says in his third edition, just issued, "A vaginal orifice, preternaturally dilated, leads, sooner or later, to vaginal invagination, and with it necessarily uterine prolapse." And if the ligaments are stretched in addition to the loss of support from below, to restore the latter would give the ligaments an opportunity of regaining their lost tone, and so effect a real cure.

Some men think that no treatment of prolapse can be considered satisfactory on account of the complexity of the accident, and of the inability to apply the treatment to the origin of the disorder, saying that all aids, by mechanical or other appliances, are simply palliative; but, because we theoretically fail, surely we are not justified in losing sight of all the many means at our disposal, certain of them in certain cases approaching very closely to a radical cure.

The cases of uterine prolapse that would be deemed suitable then would be those which Bernutz describes as procidentia without "allongement," and, of course, would not include those where hypertrophy of either the supra or infra-vaginal portion of the cervix was affected, which would require to be treated, in the first instance, at all events, by a different surgical procedure, viz., *removal* by amputation or otherwise, of the hypertrophied portion. And the

reasonableness of operating in these cases is certainly affirmed if we observe the order of events in most cases. When such a woman is told to bear down, the first thing noticed is the prolapse of the bladder, on more forcibly bearing down the rectum usually next protrudes, though this sometimes does not occur on account of the areolar connections being so much looser in regard to the vagina than in the case of the bladder, and, on further effort, the uterus is the organ which generally descends, the last of the three.

The treatment by narrowing the vaginal cavity was, I believe, first suggested by Dr. Marshall Hall, in 1831, though the subject is not mentioned in his book on the "Diseases of Females." He got the idea from Sir Henry Holland, who had introduced a pessary to support a completely prolapsed uterus for a young woman, which induced great inflammation; this was followed by such firm contraction of the vagina, that the uterus ever after remained in its proper position, and Dr. Hall relates at considerable length the details of his case, which was a complete success.

Then the late Mr. Baker Brown has done good service in the same direction, and in his book on "Diseases of Women" relates many instances of operations. It was from this latter that I was induced to try my first case; and he depicts in his work the shape and position of the pieces of mucous membrane to be removed. Dr. Henry Savage, thinking Mr. Brown's operation not sufficient, includes in his resection all the redundant vagina at its ano-vulvar margin in the first place; and in the second, the removal of a triangular portion of vaginal mucous membrane, the middle angle extending to some distance upwards, along the posterior wall of the vagina, securing with quilled sutures in the usual way. My own impression of this latter detail is that it is preferable to use separate sutures for the triangular piece in the posterior wall, as was done in my second case, where catgut was used and succeeded so well.

Marrion Sims suggests an operation by removing a **V** shaped piece from the anterior vaginal wall, extending with its point from close to the meatus to the base of the **V** close to the os; the opposite denuded arms are brought together, and a little pouch is left in the centre, into which the os may slip and be supported. This he calls elytrorraphy. His principle consists in constricting the vagina superiorly, which is thus effected by removing part of the vagina; the plans of Baker Brown and others were to constrict the vagina along the floor. In the two cases related above, both principles were relied upon, and, I think, with the advantages that might be expected from both.—*Birmingham Medical Review, April* 1876, *p.* 110.

84.—ON THE COMPLETE EVACUATION OF THE UTERUS AFTER ABORTION.

By Professor ALEXANDER RUSSELL SIMPSON, President of the Edinburgh Obstetrical Society.

[What is the best way of securing a complete evacuation of the uterus in cases of abortion and miscarriage? It is often a serious thing to leave anything in utero in such cases, and the results may appear long afterwards.]

When we have to do with a case of abortion in which the stage of expectancy is clearly over, and the patency of the os internum, or the persistence of the pains, or the hemorrhage long continued or profusely flowing, call for active interference, there are two main indications to be fulfilled, viz., 1st, to restrain the hemorrhage, and, 2nd, to procure the perfect removal of the ovum.

I. *Restraint of Hemorrhage.*—In treating of the fulfilment of the former of these indications most of our manual writers are satisfactory enough, though even under this head there is some room for improvement. In a typical case we place little reliance on rest, cold, styptics, and so on, for we know that we can only effectually restrain the hemorrhage either (1st) by compell-

ing the uterus to more energetic contractions, or (2nd) by blocking up the channel through which it escapes. In most cases we pursue both objects simultaneously.

1st. The uterus must be compelled to steady action by the administration of ergot, introduced in the form of a strong solution of ergotin in the subcutaneous cellular tissue—a mode of administration of the drug which is destined, I believe, to supersede those with which we have so long been familiar; for the subcutaneous injection of ergotin sets up the uterine contractions with such speed, such certainty, and such safety, that the hypodermic syringe will be found an indispensable part of the furnishing of every obstetric bag.

2nd. Pending the onset of effective pains, and with the view of at once hastening them and preventing the escape of the blood, we plug the genital canal. For the most part, and as if it were the best in all cases, authors recommended the use of the vaginal tampon. Now, the plugging of the vagina, by whatever material, is sometimes the only expedient to which we can have recourse, and we may rely on it with much certainty for averting the immediate danger of excessive hemorrhage. But it seems to me that, where we have our choice, its application ought to be restricted to those cases where there is still some hope that, if we succeed in arresting the hemorrhage, we shall at the same time succeed in averting the impending abortion. Otherwise we have a means of controlling the bleeding more directly, at once less irksome to the patient, and less troublesome of application by the practitioner, in the cervical plug. For this purpose there is nothing so efficient as a good-sized sponge-tent, prepared, as Messrs. Duncan, Flockhart, and Co. now always prepare them, by being dipped in a disinfectant solution before being compressed by the whipcord. In my judgment, nothing can take the place of the sponge-tent for rapid, kindly, and complete dilatation of the cervical canal. And when we have introduced a sponge-tent through the cervix uteri in a case of unavoidable abortion, we may count upon a threefold effect. *First*, The bleeding is arrested immediately and effectively; for if there be any escape into the uterine cavity, it has simply the effect of swelling up more rapidly the sponge, which blocks up its canal of exit. *Second*, The uterus is stimulated to more rapid and more energetic action, as it always is when a foreign body is introduced within its cavity. *Third*, The cervical canal is being effectually expanded during the lodgment of the sponge within it; and where a sponge-tent of good size has been well planted, it secures, as no other tent that I know of does, the expansion of the sphincter of the os internum. When, by the adoption of these measures, we have fulfilled the first indication, we have at the same time prepared the way for the carrying out of the next, viz.,

II. *The Complete Evacuation of the Uterus.*—It is in describing the methods of securing this object that I find systematic writers particularly defective. For the most part, they tell us that when the uterus fails to expel its contents, these must be extracted with the finger or fingers passed through the cervix, and hooked round the ovum or placenta, or whatever fragment may still be *in utero;* and that, when it cannot be reached with the fingers, cautious use should be made of some forceps or other instrument. But then the methods by which the uterine cavity can be reached through the vagina are hardly more than hinted at, with a few exceptions, as by Cazeaux, who, in a single line, speaks of "strong pressure upon the hypogastrium to depress the womb;" and Schroeder, who, somewhat more fully, describes the bi-manual manipulation. If, *e.g.*, we open the latest work, the deservedly popular "System of Midwifery" by Professor Leishman, we read—"The finger is to be cautiously passed round the protruding portion, and, if necessary, another finger may be introduced into the os. If we can thus succeed in getting a hold of the placenta upon which we can rely, it may be extracted entire; but a rude or unskilful mode of manipulation may entirely frustrate our efforts by leaving behind a portion of what we wish to extract whole. It is impossible to lay down rules for the skilful performance of this manœuvre, which can only be taught by experience; but we have no doubt that more *reliance* is to be placed upon the fingers than upon instruments, as a general *rule.*' It is little wonder, if, a page further on, we find him speaking on the

after-treatment (p. 434) of fragments of placenta giving rise again to hemorrhage; and all that is said of the treatment in that case is, that "the patient must not be permitted to rise until all trace of this has ceased!" Why, the abortion in that case in unfinished, and we have no right to expect a cessation of the hemorrhage until the delivery has been complete. It always seems to me that there are few obstetric manœuvres capable of clearer exposition than the manipulations that we employ for emptying the uterus in the last stage of an abortion. Let us first have a clear idea as to what is required to be done. We have to pass one or more fingers into the cavity of the uterus to explore the entire cavity, to separate from its walls any adherent portion of the ovum, and then to extract the separated mass. I say at once, and simply, that it is the fingers of the operator that are to do the intra-uterine work, for I am quite at one with those who deprecate the use of instruments, such as curettes, wire-loops, crotchets, and abortion forceps, for the *detachment* of retained ova or their fragments. When the adhesions have been all separated by the finger, it may sometimes facilitate the removal of the loosened body to seize it with such instruments, and in that case, a pair of long dressing forceps, or polypus forceps, suits as well as any special implement; but the detaching of the adherent portions of the placenta should in no case be intrusted to these, or attempted with them, seeing that it can always be effected by the use of the sense-guided finger.

But how are we, with the finger or fingers, to reach so high in the cavity of the uterus as completely to surround the ovum? To begin with, the patient should, as a rule, be anæsthetized. The manipulations necessary to secure a satisfactory result cause suffering, though not to a great degree, which we can always save the patient by bringing her under the influence of chloroform. And at the same time that her sense of pain is abolished, her voluntary muscles are completely relaxed, and it becomes easy for the practitioner to press down the uterus through the abdominal parietes. Once and again I have found myself baffled in the effort to reach the fundus uteri in such a patient until I had chloroformed her; for, however willing the woman may be to further your efforts for her delivery, involuntarily she contracts the recti abdominis when you make pressure on the hypogastrium, or withdraws herself when you press the other hand against the perineum. The patient, then, having been anæsthetized, we may render the uterine cavity accessible to the exploring finger in one or other of two different ways.

1st. We can push down the fundus uteri from above. The patient may lie either supine or in the ordinary obstetric position on her left side, with the knees drawn up; most frequently the right hand will be used for internal manipulation, while the left is applied to the abdominal surface. It rarely suffices to pass one finger alone into the vagina. In most cases the index and middle fingers are passed into the vagina, and while the middle finger is folded in the fornix to steady the uterus there, the forefinger is passed through the cervix. Or the middle finger can sometimes be more satisfactorily employed for the intra-uterine digitation, or, better still, both fingers may be passed into the uterine cavity. In the last case it may become necessary to have the other two fingers carried into the canal of the vagina, the thumb alone remaining external to the vulva. It is usually only in patients who have miscarried at the fourth month, or beyond it, that the hand requires to enter so far for the separation of the placenta, and then the vaginal cavity is relaxed and roomy enough easily to permit of it. Whilst the fingers of the right hand are thus seeking their way up to the recesses of the uterus, the left hand applied above the brim of the pelvis, is pressing the uterus forcibly and steadily downwards into the pelvic cavity. In this way, in the great proportion of cases, we obtain perfect command of the uterine contents. The fingers of the two hands recognise each other through the double thickness of the abdominal and uterine parietes; and while the left hand keeps the fundus fixed firmly downwards, the forefinger of the right peels off the adherent mass and forces it through the cervical canal. In the great proportion of cases, I repeat, we can in this manner compel the evacuation of the uterus, and when it fails us our resources are not yet at an end, for, if

2nd. We can drag down the cervix from below. The first is the method that has most frequently been employed, and it has this in favour of its common employment that abortions are more frequent in multigravid than in primigravid women; in women, therefore, in whom there is usually a degree of abdominal relaxation, which greatly favours its execution. But where the walls are more resistant, or the patient is so fat that the combined external and internal manipulation fail us, then we must seize one or other of the lips of the uterus—usually the anterior—with a volsellum, double or triple pronged, and slightly curved. One of the blades grasps the vaginal aspect of the front wall of the cervix as high up as the roof of the vagina, the other at a corresponding level within the cervical canal. The uterus is capable of being dragged far down without any injury to its ligaments or laceration in the bite of the volsellum. It may be pulled down with the right hand and kept fixed with it, whilst the fingers of the left pass into the cavity and explore and evacuate it. Or the volsellum may be held in the left hand, or given to an assistant, to keep the uterus depressed, whilst the more familiar right-hand fingers do the intra-uterine work. The cavity of the uterus is thus brought within full reach of the fingers, and we can—and in all those cases of imperfect delivery in the early months we ought to—control the emptying of the cavity from fundus to os.

Whilst the method of gaining access to the interior of the uterus by pressing it down from above is that which has hitherto been ordinarily followed, my own experience leads me to expect that this second method, which I have just described, will largely supersede it. For, first, it is applicable in all cases where the other can be employed, and in some where the rival method is not available. Second, it is less painful, and may be carried out occasionally when there is not time for the administration of an anæsthetic. Third, it saves the expenditure of muscular power demanded of the practitioner, who presses and keeps the uterus pressed down from above only by overcoming the resistance of the abdominal walls. The one circumstance that will enable the bi-manual method to hold its ground is that we may find ourselves called on to clear out the uterus at a time when we have no volsellum at command, whilst our hands we always carry about with us.—*Edinburgh Monthly Journal, May* 1876, *p.* 962.

85.—A CASE OF DIFFICULT LABOUR FROM ABNORMAL RIGIDITY OF THE OS.

By Dr. GEORGE CALDERWOOD.

[In the case which forms the subject of the following article the os uteri, from the commencement of labour in the night and during the whole of the following day, remained in the same rigid unyielding state. The pains during the whole case were strong, but quite inoperative owing to the state of the os. It became evident that some artificial assistance must be given.]

The question was, What was to be the nature of that interference? Forceps were inadmissible, as the os was undilated. The one great object to be attained was to effect its dilatation. The question was how? I have the greatest confidence in Barnes's dilating bags where there is no unnatural rigidity, but in this case I felt they would have been powerless to effect the purpose intended. Another method recommended in these cases is to make small incisions, cutting the os in several directions; but had I done this, I was afraid such incisions would act as centres for subsequent tearing, in any further efforts that might have to be made to effect delivery, and even in the indurated state of the parts by the natural contractions of the womb itself.

Considering all these points, and the case being now urgent, I resolved to *dilate* gradually with the hand, and then turn and deliver. I accordingly proceeded to do so. One finger was first passed through the os, then after a

time a second, and so on till all the fingers were introduced. The constriction at this time was most powerful, and I therefore rested for a considerable time without making any further efforts at progress. At last with some difficulty I succeeded in introducing the whole hand within the uterus, without any perceptible laceration. I then, after waiting a short time, turned and delivered, in the performance of which no unusual difficulty presented itself. The same difficulty that existed to the passage of the child existed to the passage of the after-birth. The womb contracted well, but neither by external manipulation, nor by gentle traction at the cord, could the placenta be removed.

After waiting a proper length of time, I was compelled a second time to introduce my hand through the os, having much the same rigid feel. I went through the same slow process—one finger after another—and found the placenta completely detached from the uterine wall, and readily brought it away. The only object preventing its passage was the rigid os. The patient made a good recovery.

My object in relating this case—and similar cases must be frequently occurring to daily practitioners—is to show what may be done by the hand, provided due caution be used, and above all, provided the operation be not hurried. Milder remedies should first be tried, but should they fail, the gradual dilatation of the os by the hand may with proper care be attempted. In ordinary cases of dilatation of the os, or where it is desirable to produce it with a view to bring on labour, the use of Dr. Barnes's bags is, I believe, the proper course to follow. In such a case as this the choice was betwixt the operation performed and incisions. The latter is, I think, much more likely to be followed by disastrous results than the former when judiciously employed. The laceration produced in this case must have been very slight, if any at all, as was shown by the same condition presenting itself to the passage of the placenta after the passage of the child. Incisions must have produced a breach of surface, and each incision must have been the seat of laceration to a greater or less extent. In that case absorption of septic matter would have been rendered an easy matter and the danger greatly increased. I ought to mention that her two previous confinements were difficult—instrumental, as I was informed—and it is possible and highly probable that in one or other of these, such changes may have been produced in the neck of the womb as have resulted in its present rigid condition.

To sum up. Use Dr. Barnes's dilating bags if they are suitable for the case—that is, if you have time and if they are sufficient to effect dilatation; if not, use the hand as I have described, in preference to incisions.—*Obstetrical Journal, Jan.* 1876, *p.* 657.

86.—TREATMENT OF SHOULDER PRESENTATIONS.

By Dr. Edward Warren, Paris.

[The following is taken from a letter by Dr. P. R. Maxson, of Syracuse, New York, giving an account of his treatment of shoulder presentations.]

He says: "I hasten to give you in a condensed form an account of my plan of *treating shoulder presentations.* Gravity is the principle invoked; and I was led to the discovery in 1860 by placing a woman with prolapsed cord on her knees, with her head and shoulders low, as recommended by Dr. T. G. Thomas, of New York, in order to effect its reduction, and finding that while she was in this position an abnormal (abdominal) presentation was spontaneously converted into a normal one. Having reflected on this circumstance, I was induced a few weeks later, when called in consultation in a bad shoulder presentation, to try *position* as a means of rectifying it. I was very anxious in regard to the case, because the lady had lost three children already from 'turning to deliver' in shoulder presentations. Her regular attendant, Dr. G. N. Dox, of Geneva, New York, a physician of attainment and experi-

ence, happened to be the *confrère* in whose practice the case of prolapsed cord, above referred to, had occurred; and instead of 'turning' himself, as had been so unsuccessfully attempted in the lady's previous labours, he sent for me in consultation. Remembering the fate of the other children, and finding this one very large, I suggested the feasibility of correcting this *shoulder presentation* in the same manner as I had corrected the *abdominal* in the first instance. With his consent I made the effort in the following manner:—I folded several quilts compactly, laying them one upon another to the height of about one foot, and assisted her to kneel upon the quilts, with her head and shoulders resting upon the bed, and her face forwards, so as to bring her body to an angle with the bed of nearly 90 degrees. I then pressed my hand gently against the shoulder, which readily receded, until I was enabled to clasp the vertex with my fingers, and with the assistance of the next pain to so 'engage' it, that, when the patient was placed upon her left side and the quilts removed, a perfectly natural presentation presented itself. In a few hours the labour terminated in the delivery of a healthy boy, weighing ten pounds. Only a few moments were occupied in the process, and subsequent experience convinces me that *shoulder presentations* can generally be converted in this way into *natural* ones, without a resort to 'turning,' and with no risk for the mother or the child."

I would add that this method of treatment has received much attention in America, and that no inconsiderable amount of testimony has been accumulated in support of its efficacy. Dr. Maxson also informs me that he submitted his views in this regard some years since to Sir James Simpson, and that they were cordially endorsed by that distinguished gentleman.—*Lancet*, *Dec.* 18, 1875, *p.* 897.

87.—LACERATION OF THE PERINEUM.

By Dr. JAMES YOUNG, Vice-President of the Obstetrical Society of Edinburgh.

The treatment of laceration of the perineum is one of the most important questions that can come under the notice of the obstetric surgeon. I propose to cite two cases, illustrative of the benefit of treatment by the interrupted suture, more to elicit discussion than for the purpose of bringing forward any new matter. The second case is almost unique in regard to the extent of the rupture, and likewise the result.

Case 1.—Some twelve months ago I was in attendance upon a lady in Maitland Street. It was her first confinement. The labour was protracted and difficult, requiring the use of the short forceps. I used very considerable strength in traction, but without the pendulum movement, and failed to extract the head. I sent for my friend Dr. Charles Bell, who kindly came to my assistance. The forceps were again applied, and the pendulum motion, with powerful traction, was successful in delivering the patient of a fine, large, healthy boy; the perineum was torn, but not through the sphincter ani. The wound was carefully sponged, and brought together with the interrupted suture in three places in less than half an hour after the accident. The result was most satisfactory, and the patient made an excellent recovery. The ligatures came away in four days, and the wound was absolutely healed in ten, at every point. The usual rules were enforced.

Case 2.—To this one I would direct attention. On the 28th of June, 1875, I was summoned to see Mrs. M., æt. 35, a primipara. At 6 p.m. the os uteri was small (size of a shilling), although the patient had been in labour for twelve hours. I was again called at 6 a.m. next day, when I found the first stage almost over, and the head presenting in the occipito-anterior position. The woman had been twenty-four hours in labour, and as I considered it unjustifiable to leave her longer, I sent for the forceps. The *vagina* was hot, and the pains were becoming feeble. While under chloroform, I used steady traction during each pain, allowing the external parts

time to dilate slowly. Notwithstanding every care, the perineum ruptured right along through the sphincter ani, and into bowel three inches, my whole index finger easily passing from bowel into vagina. When the placenta was expelled, and the uterus contracted, the wound was carefully sponged. The anæsthesia being maintained, the torn parts were brought together with the interrupted suture. Seven ligatures were used, which had been dipped in carbolic oil, and the wound was left in perfect approximation. The urine was drawn off every twelve hours. The thighs were tied together, and by the administration of opium, the bowels were confined for six days. No local dressings were used. The patient made a perfect recovery; the wound healed throughout at every point; and on the fourteenth day she was left to her own care. Several weeks ago, I examined the patient by placing one index finger in the bowel, and the other in the vagina, and found the recto-vaginal septum complete. Let me here mention, in connection with her history, that when Mrs. M. was married, I understood that perfect sexual intercourse was precluded for some months in consequence of the extreme rigidity of the vagina, and four years elapsed ere this child was born.

Remarks.—1st, Causes of laceration of the perineum; 2nd, Means of prevention; 3rd, General rules of treatment. Many obstetricians will agree with me in saying that, in numerous primiparous cases, the perineal portion of the vaginal mucous membrane is frequently ruptured, and only heals by leaving a sulcus, which rather favours than hinders future labours. Among the causes of perineal rupture might be enumerated, 1st, When the age exceeds *thirty* years; 2nd, Cases where the head of the child is very large; 3rd, Malpresentations; 4th, A small or deformed pelvis; 5th, The use of forceps; 6th, A rigid perineum; each cause operating more especially in primiparous women.

Prevention.—I generally adopt the plan of having lard, butter, or cold cream, rubbed over the perineum during the extrusion of the head forwards. 2nd, Gentle dilatation of the external parts with the finger may be adopted during each pain; 3rd, Slow traction, when the forceps are used, and only during each consecutive pain: 4th, The application of the hand in supporting the perineum during strong expulsive pains; and when forceps are employed, during the delivery of the head, the left hand may be spread over the distended surface of the perineum.

Treatment.—In simple cases of laceration of the mucous membrane of the vagina, or even where the margin of the sphincter vaginæ is torn, the only treatment necessary is mere cleanliness and sponging. I extremely deprecate, in any case, the use of bandages, pads, or plasters, as being more irksome to the patient than useful. In severe perineal rupture, as in Case 2, the immediate closing of the wound is of paramount importance, so as to secure healing by the first intention. The interrupted suture of carbolised catgut should be used; and the entire rupture must be brought into exact approximation. Careful and frequent sponging must be attended to by the nurse, to avoid any irritation from the lochial discharge. The urine must be drawn off every twelve hours; no dressings applied; the patient kept in the horizontal position; the thighs kept together; and the bowels must not be allowed to move for six days.—*Edinburgh Medical Journal, Jan.* 7, 1876, *p.* 607.

88.—REPORT ON THE TREATMENT OF RUPTURED PERINEUM.

By Thomas Smith, Esq., Assistant-Surgeon to St. Bartholomew's Hospital.

[The treatment of ruptured perineum by postural means alone, during the fortnight or three weeks succeeding labour, although so generally adopted, unfortunately often fails. It is better at once, or within a day or two, to insert some sutures—it will lead to less discredit in the end.]

Where for any reason the rent remains unclosed after recovery from

childbed, the operation should certainly be postponed until the process of uterine involution is complete, and normal health has been regained. It is prudent to delay operating until the cicatrisation of the torn surfaces has taken place, for without doubt the freshly-pared mucous surfaces would be more likely to unite quickly and soundly than surfaces formed of the deeper layers of granulations, where possibly the new tissue had scarcely completed its perfect organisation. Though it is certainly an advantage that all vaginal and uterine discharge should have ceased before any operation is performed, yet the presence of leucorrhœa is no bar to success should other circumstances be favourable.

In a case under my own care, in which the leucorrhœal discharge could not be arrested by treatment, the operation was performed with a good result, though the discharge gave some trouble during convalescence.

It need only be mentioned that no operation should be performed during lactation ; while, as a rule, it may be left to the patient to decide whether she will wean her infant, and submit to an early operation, or bear her troubles until the natural termination of lactation. The only reason that can be urged against this course is the possibility that during the postponement of the operation prolapsus uteri may occur. This consideration, I think, should have some weight in determining the date of operation. I have recently cured a patient of a rent perineum who suffered from complete procidentia uteri. She was only twenty-four years of age, and the rupture had existed a year and nine months. In her case, at least, one would think that the uterus had begun to descend before the period when lactation usually terminates.

The treatment of ruptured perineum, when undertaken immediately after delivery, resolves itself simply into readapting the opposite surfaces of a wound which are in a condition most suitable for union: they are freshly torn, they exactly fit one another, and the parts are so lax that there is no tension on the sutures. The only point for consideration is the selection of the best material to use for sutures, and the best means of introducing the sutures. Soft silver wire is, as I believe, the very best material, on account of its cleanliness, the very slight irritation it causes in the tissues through which it passes, its inelasticity, and the ease with which it is withdrawn.

Soft iron wire is only inferior to silver on account of its tendency to become hard and corroded when left for some time in a wound, and thereby giving some pain in its withdrawal Silk and twine are less suitable as materials for suture, as they cannot be long retained without exciting suppuration.

Catgut, whether carbolised or not, is to be rejected altogether for the operation under consideration. If carbolised, it is liable to undergo solution in the secretions of the wound; while ordinary catgut is uncleanly, and irritating to the tissues.

Any form of suture-needle may be employed that will carry the suture through the whole depth of the wound, entering the skin a full inch from one margin, and emerging at the same distance from the opposite. Least painful to the patient is some kind of tubular needle, through which the wire may be pushed, such as Startin's or Matthieu's needle. Just as efficient, though causing more pain, is the large sickle-shaped needle, fixed in a handle, having an eye at the point. If such an one be used, it should be thrust through the soft parts without the suture, the latter being threaded when the needle-point emerges from the skin, having completely transfixed both sides of the rent: the needle, as it is withdrawn, will leave the suture in position.

For very slight ruptures no such formidable instrument is required as the one above mentioned, since the curved needles that are ordinarily carried in a pocket-case will suffice.

In operations performed within a few days of delivery, unless the rent lay open the rectum, the sutures may be fastened by simple twisting; and unless they excite irritation, these may remain *in situ* for a fortnight. When the *rectum* is laid open it is more prudent to fasten the sutures to leaden plates, *buttons* or pieces of bougie, so as to bring the parts together after the man-

ner of quilled sutures, two or three superficial interrupted sutures being also inserted.

It will be convenient to consider here two questions of great importance in the after-treatment of operations for ruptured perineum—

1st, When should the sutures be removed?

2dly, How should the bowels be managed?

With regard to the removal of the sutures, Mr. Baker Brown (to whom belongs the credit of introducing the essential details of the operation now generally adopted) makes the following statement:—"The deep sutures should be removed on the second day; in about forty-two hours is the best time. On the sixth or seventh day, the interrupted sutures may be taken away."

Mr. Erichsen states as his opinion "that the deep sutures should be left in for three days; in some cases they may even be retained for ninety-six hours. If any suppuration occur along their track, they must at once be withdrawn. The superficial sutures should be left in as long as they produce no irritation."

Mr. Bryant on this point remarks—"The deep sutures should be removed on the third or fourth day, the superficial on the seventh."

Mr. Hutchinson, on the other hand, says—"The sutures should not be removed until the sixth or seventh day."

My own experience quite agrees with all the above-mentioned opinions, it being remembered that the three first-named surgeons are speaking of quilled sutures made of silk or twine, and fastened to pieces of bougie, stick, or thin ivory rods, while Mr. Hutchinson refers to wire sutures fastened to metallic plates.

There can be no doubt that quilled sutures of twine or silk, fastened to pieces of cane or bougie, cannot be left in longer than forty-eight hours without running a risk of exciting suppuration in the suture tracks, and causing sloughing of the integuments beneath the quills or bougies.

It is, on the other hand, quite certain that, as a rule—if the deep sutures be metallic, and if they be fastened to flat plates, very wide bars, or large studs or buttons—they can be allowed to remain in for a week or more without injury to the soft parts, either from sloughing of the integuments or from suppuration in the suture tracks.

The deep sutures should not, as a rule, be left in more than a week, since the tendency of this kind of suture is to cut its way out from the deepest part of the wound towards the surface; and in this way, doubtless, a cavity may be formed between the rectum and vagina which may give rise to a recto-vaginal fistula.—*St. Bartholomew's Hospital Reports*, 1875, *p.* 215.

89.—FOLDING SHORT FORCEPS.

By W. Draper, Esq., Surgeon to the York Dispensary, late Resident Obstetric Officer to the Middlesex Hospital.

The forceps about to be described take the name of *folding* forceps, in consequence of the two blades of the instrument being so constructed as to fold one within the other in such a manner that both are introduced at the same time. In the accompanying illustration, Fig. 1 shows the forceps closed for introduction, and Fig. 2 exhibits them open.

To the invention of the general principle of the forceps (that of the simultaneous introduction of the blades one within the other), I do not for one moment lay the slightest claim, for I believe Dr. Vacher was the originator of the idea. My forceps are a modification of Dr. Vacher's, and, after a fair trial of both, I venture to say that my instrument is a considerable improvement upon the original design. A short description of both forceps will best show the relative merits of each.

In Dr. Vacher's forceps the handle is small and spindle-shaped, affording but

a slight and uneasy hold for the hand; in the middle of the handle there is a projecting knob, the proximal end of a hinge-bolt; this knob forms a most inconvenient obstacle to the hand when the handle is grasped. Then, again, at one end of the handle there is an awkward lever, connected with a catch which locks the handles together. This lever projects considerably beyond the handle, and therefore forms another object of discomfort to the operator's hand; moreover, the projection is very apt to catch the bedclothes, or the patient's dress, the result of which would be that the lock would be set at liberty, and the blades would lose their hold of the fœtal head.

These matters may at first sight, appear trivial, but as a matter of fact, practically, they are of no small importance both to the comfort of the operator and to the effectiveness of the instrument.

Fig. 1.

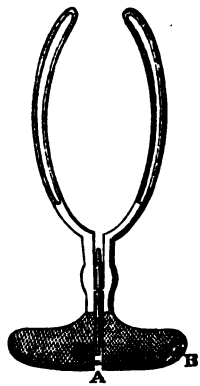


Fig. 2.

In describing these points I do not at all wish to detract from the value of Dr. Vacher's forceps, my only aim being to remedy defects, and to introduce a more perfect and convenient instrument.

As to my own forceps. In the first place when open, the handle, which is made of ebony, is of the form depicted in Fig. 2, and fits the palm of the hand and the fingers perfectly, and a good firm grasp of it may be obtained, and maintained, without discomfort. This handle is neither clumsy nor weighty. The proximal end of the hinge-bolt, which connects the neck of the forceps, is bent at right angles, and being let into one side of the handle, it is quite concealed, yet, if it be necessary to separate the blades during an operation, this separation can be quickly effected by a very simple movement. Then, again, my spring lever, in connection with the catch which locks the two parts of the handle together, is enclosed within a thumb depression at one extremity of the handle; the lever, therefore, and the parts upon which it operates, are quite out of the way, yet by placing the tip of the thumb in the depression, the spring readily acts.

The blades of my forceps are made as light as possible, consistent with a moderate degree of strength, and as the instrument is applicable only in cases in which no great amount of force is required, it is unnecessary for its blades to be either stout or heavy. The pair of forceps which I now have in use weigh only 8 oz. I consider, however, they might, with advantage, be made still lighter. My instrument, too, is electroplated, the great advantage of which being, that the hinge-joint upon which the blades revolve, and the spring lever and catch, are not liable to become rusted by the secretions, &c., and their action thereby interrupted; and, further, the plating insures the general cleanliness of the instrument. The forceps are so small and portable that they may be conveniently carried in the breast pocket.

A word or two as to the way in which the instrument is applied, and the *conditions* under which it is most useful, may not be out of place.

The forceps being *folded*, with the convexity of one blade lying within the concavity of the other (as Fig. 1), the *two* blades are simultaneously introduced exactly in the same way that one blade of the ordinary short forceps is introduced; this having been done, one-half of the cross handle is held *in situ*, while the other half is gently separated from it, the result of which is that the small hinge-joint, connecting the shanks of the blades together, is acted upon, one blade glides from under the other, over the fœtal head, and, with a little management, this revolving blade is easily got into position opposite to the fixed blade: the two halves of the handle now come into apposition, when, by means of the spring catch, they are firmly locked together, and form the cross handle shown in Fig. 2.

If, during an operation, it be desired to take off the forceps, it is necessary simply to withdraw the hinge-bolt, when the two blades are at once separated and set at liberty.

A difficulty may probably be apprehended by some in getting the instrument to act properly in a contracted tense vagina, in a narrow pelvis, or in certain positions of the fœtal head, but the room taken up by the blades is so small, and so flexible are they, that no such difficulty *really* presents itself.

The forceps are *applicable* in all that numerous class of cases in which slight assistance is indicated to terminate tedious, but otherwise natural, labours—in fact, they may be employed in all cases in which ordinary short forceps are applicable. They are, I need hardly say, available only after the head has passed through the pelvic brim.

There is one more point worthy of note—viz., that these forceps may be used, if it may be deemed desirable, under the bedclothes, without the knowledge of the patient or her attendants; and it is, I hold, often a matter of no small importance, that a sensitive and delicate patient should be saved the shock and natural dread occasioned even by the most gentle mention of the use of *instruments*.

Finally, I am satisfied, that if these forceps be carefully and judiciously employed, they are capable of being a great and efficient aid both to the patient and to the obstetrician.—*Obstet. Journal, Feb.* 1876, *p.* 715.

[Mr. Draper's forceps are made by Arnold and Sons, 35 and 36 West Smithfield, London. Dr. Vacher's forceps are described and figured in *Retrospect*, vol. lxvii, p. 272.]

90.—AGAINST THE PENDULUM MOVEMENT IN WORKING THE MIDWIFERY FORCEPS.

By Dr. J. Matthews Duncan, Edinburgh.

[Most men who use the midwifery forceps frequently must perceive that the side-to-side movement of the blades, as recommended and usually practised, is not productive of good, but harm.]

In the following remarks I shall make reference only to that pendulum movement from side to side, which alone is, so far as I know, recommended in these latter times. The pendulum movement in a sagittal direction, as recommended by the early describers of the forceps operation, is still more open to objections than the former.

In describing or defending the pendulum movement, two great points are made: first, that it is analogous to, or identical with, that of a lever and double rack; and, second, that by resorting to it there is an economy of force.

The lever and double rack hypothesis may be considered first. It is difficult to dispose of it only because it is so flimsy that it is impossible to get hold of it. There is no toothed rack on the wall of the pelvis. There is no roughness to take the place of a toothed rack. Were there any such teeth or roughness, the worst use that could be made of them would be to make them assume the function of a rack. The accoucheur should strive to advance the head as smoothly and with as little impression as possible on the walls

of the pelvis. Further, there are no teeth or roughnesses on the fœtal head to fit into the teeth of the supposed rack.

Without the lever and double rack hypothesis sustantiated, the movement must be useless; for it is, and must be, done to no purpose. It is conceivable that the head may be seized with such a degree of firmness by the blades of the forceps as to be moved or made to revolve as on a pivot; but such movement, without the additional force required in simple and successful traction, uncomplicated by the movement, would be of no avail. It would not advance the head. Without the lever and double rack, it would only cause revolutions as on a pivot—it would not produce progress.

Let us imagine that the accoucheur, dragging to one side, produces advance of the opposite side, which he maintains by continued dragging, while he makes the oscillatory movement in order to drag to the other side. In this way he may make the head advance while using an oscillatory movement. Every one knows that this is easily done. But then every one must also recognise the utter inutility of the movement. It is the imitation of the action of a lever and double rack without a trace of its utility. An unnecessary movement like this has great disadvantages. The pressure exerted, and the traction force used, are probably greater, certainly not less, than if simple traction were exerted to produce the desired result. Pulling the head down at one side and then at the other, and so advancing, is merely an injuriously complicated way of producing simple progress. It produces no evasion nor diminution of the difficulty to be overcome, while it has concomitant and avoidable evils.

In answer to this reasoning one might refer to an analogy in the way in which a cork is sometimes extracted from a bottle without using a corkscrew. But a study of this analogy only confirms the argument. For the cork would be better, and on the whole easier, extracted by simple uncomplicated traction as by a corkscrew. Besides, the cork and the bottle mutually exert such friction force as prevents retraction of one side if advanced, just as if the bottle were a rack and the cork the lever; and such is in no sense the case with the fœtal head and pelvis. Lastly, this oscillatory advance of the cork is only sought when power fails to produce a direct advance, and, in the case of the forceps, there is never deficiency of power: for, as we have already said, the power applicable by the accoucheur is practically boundless, or, in more sober terms, it is greater than he can safely apply.

The idea that there is any saving of force, so far as pressure on the mother's and child's part is concerned, by resort to the oscillatory or pendulum movement, is such that I cannot argue against it. The question involved is purely mechanical and of extreme simplicity. It is this : a mechanical difficulty in bringing a child's head through a resisting passage has to be overcome ; further, the difficulty is not to be evaded by changing the position of the child's head; on the contrary, that position may be supposed to be the most favourable for facility of propulsion. Now, can any oscillation or other imaginable movement diminish the mutual, and, in this case, injurious pressure or force required to produce advance? The question requires no answer. The supposition is absurd. Moreover, the absurdity is not less, whatever phase may be given to the hypothetical advantages of the pendulum movement. A certain amount of work has to be done; the head has to be advanced against resistance that must be overpowered if the effort is successful. Direct uncomplicated traction does the work in the simplest way, and no complication of it by pendulum movement or other can diminish the amount of work expended below that required by simple traction. The complication of simple traction may, however, increase the expenditure of force to a great extent.

The pendulum movement necessarily involves an injurious amount of pressure and consequent friction, in all cases, between the parts of the head to which the blades of the forceps are applied and the adjacent maternal structures. No doubt this friction is in most cases so slight and temporary as to be of little moment. But in some cases, when the resistance to progress *arises from* tight and undilatable soft parts, it may be very injurious. The *most important* forceps cases, however, are those where the obstacle to pro-

gress arises from hard parts; and, of these cases, the most frequent and characteristic are those of simple narrow or flat pelvis. In such cases the head has to be slowly dragged and perhaps moulded between the promontory of the sacrum and the pubic bones. Now, here, the pendulum movement involves special evils and dangers; for by it there is necessarily produced, besides the trivial friction, which is most extensive at the points where the blades are applied, a violent and powerful squeezing of the soft parts between the head and the opposing pelvic bones, on which the head works. This combination of wriggling and squeezing is altogether unnecessary, and must greatly aggravate the necessary or unavoidable mutual pressure, which is bad enough.

If, for the carrying out of the plan of pendulum movement, the forceps is made to compress the head so strongly as not to slip on it, which mode is probably regarded as desirable, then the points of the forceps, and especially the point of that blade which is on the side of the head towards which the movement is given, will exert a specially powerful, and certainly undesirable, amount of pressure on the parts of the child's head or face which they touch. If, on the other hand, the blades do not press the head with such firmness as to obviate a to-and-fro motion of them on the head, then the scalp will be liable to be much injured, and its surface abraded; conditions which are often observed as the result of this kind of proceeding.

There is, in the mechanism of delivery, whether natural or morbid, nothing analogous to this artificially produced oscillating or pendulum movement. Nature pushes a fœtal head through an obstructing passage by force, which produces, or may produce, on the one hand, dilatation or laceration of the passage; and, on the other hand, various kinds of changes in the shape and size of the fœtal head. Our best guide in forceps cases is the process of nature; and it is probable that any future improvements in the working of the instrument will be the consequence of closer and successful investigation of the mechanism of labour in these difficult cases. The pendulum movement, in working the forceps, does not advantageously increase the power of the instrument to produce desired results.

The use of the forceps is to contribute, by artificial pulling, to the strength of the natural expulsive efforts which push. To this traction, judiciously applied, the practitioner should confine himself. The oscillatory movement will contribute nothing to the forward traction, and it is the forward traction which alone is desirable.

In corroboration of these theoretical views as to the injuriousness and inutility of the pendulum movement in the working of the midwifely forceps, I might appeal to the extensive experience of myself, and of many other practitioners. But such appeal can only be held as evidence sufficient to show that the pendulum movement is not necessary. It affords no evidence that using it or abstaining from it is the preferable plan. And I cannot imagine any method available at present whereby the results of experience can be made suitable for the final settlement of the matter.

Both plans are used by good practitioners. Traction without oscillation is simple, effective, and in accordance with the method of nature's own efforts. Traction with oscillation is complicated: and many theoretical and practical objections may be made to it.

Other objections might be adduced against the pendulum movement, and some are candidly stated by authors who recommend its adoption. I have confined myself to the discussion of its supposed utility and inevitable evils. The only advantage which I can conceive it to possess, is one to which no one will avow his indebtedness, for it would be an admission of culpable want of knowledge, and consequent unjustifiable practice. A practitioner ignorant as to the proper direction of pulling may, by this motion of the forceps while extracting, fall accidentally upon the right direction, and thus do some good by mere luck, and at much risk, which should have been done intelligently, and without avoidable risk. It is, perhaps, in order to ensure this kind of possible success, that some authors recommend the movement to be not pendulum-like, but rotatory, or in the grand so-called tours.—*Edinburgh Medical Journal, Feb.* 1876, *p*, 683.

91.—REMARKS ON THE INEVITABLE AND OTHER LACERATIONS OF THE ORIFICE OF THE VAGINA, AND NEAR IT, IN PRIMIPARÆ.

By Dr. J. Matthews Duncan, Edinburgh.

In the outset I desire carefully to point out that anatomically the orifice of the vagina and the obstetrical perineum have no direct connection. They are quite distinct parts, removed from one another by the structures forming the fossa navicularis. It is the orifice of the vagina which I declare to be invariably injured in the natural labour of a primipara. The perineum does not always escape laceration, but it frequently does so. It is not only anatomically that the orifice of the vagina is distinct from the perineum; it ought to be distinguished practically. When the head is on the perineum, or has passed beyond the outlet of the ligamentous pelvis—"out of the bones," as I have heard midwives call it—it is generally described as retained by a rigid perineum. But this description is plainly often inaccurate, for the perineum has yielded as much as can be expected or wished of it, and yet the head is not born. This condition is seen almost exclusively in primiparæ, and it is the orifice of the vagina, not the perineum, that is undilatable or rigid. [In such cases, it is habitual to deliver by the finger in the rectum pressing on the glabella in a proper direction, to force the head through the orifice of the vagina. This proceeding I object to, as I have elsewhere described, preferring the safer and equally efficient pressure through the skin in front of the coccyx or in the region of one or other sacrosciatic ligament.] To nearly complete the proof of my statement I have only to add, that in such cases the birth is often completed without injury of the perineum, the frænulum or fourchette even remaining entire. When the undilatability of the orifice and lower part of the vagina is great, and demands interference by the practitioner before the head has descended so far as to be amenable to pressure on the glabella, the forceps is applied; and, under such circumstances, I have often delivered without any injury of the perineum resulting, though certainly not without any injury of the orifice of the vagina.

After a natural labour the pudenda lose their characteristic appearances. The hymen is partially or completely destroyed. If the orifices of the ducts of Duverney's glands are not discoverable, it is impossible to say exactly where any part of the vaginal orifice is, except when distinct remains of hymen are seen. The distinction of the fourchette or posterior margin of the vulvar outlet from the margin of the vaginal orifice cannot now be made with any exactness. The labia majora have shrivelled, and the position of their projecting posterior piers is ill defined. If in a multipara the head is obstructed by the undilatability of the orifice of exit from the woman's body, then it cannot be said that the vaginal orifice is rigid and obstructing, for that part is not recognizable. It is the vulvar outlet that, by its undilatability, impedes progress. But the vulvar outlet from the genital passage is not the same thing as the vaginal orifice.

The lacerations of the vaginal orifice, as distinguished from those of the perineum, are very important. They may be the seat of pyæmic infection. Those in the anterior part of the vaginal orifice often produce hemorrhage, which is occasionally, but rarely, even fatal, especially if the tear extends to the clitoris. Those on the posterior part of the vaginal orifice may be the commencement of greater lacerations, and they may be not only the commencement, but also predisposing causes of further laceration.

The lacerations of the vaginal orifice are not only to be distinguished from those of the perineum, but also from the other lacerations of the vagina. These are splits of the vaginal tissues of greater or less depth. They often are quite distinct from the upper vaginal lacerations connected with laceration of the cervix uteri, just as they are distinct from the lower vaginal lacerations connected with the vaginal orifice. They are produced by over-distension of the canal, and, as might be expected, are longitudinal in direction.

It would appear that, in the Darwinian progress of the species, the head

of the fœtus has increased in size more rapidly than the orifices and passages through which it has to come have increased in size or dilatability. For it can scarcely be supposed to be a final arrangement that the cervix uteri should be torn so often as it is in giving passage to the child; and the same may be said of the lacerations of the vagina, the vaginal orifice, and of the perineum.

When, in a primipara, the head has distended the perineum, it is arrested by the vaginal orifice. During a pain, the head is propelled against the orifice in the line of its axis, or nearly so. A part of it acts on the orifice as a wedge projecting through it, and helping to dilate or distend it, or to burst it. If the orifice is unyielding, the pains push it as a whole more and more forwards, and among other consequences of this there is great elongation of the perineum. All parts of the circle are pushed forwards, the fourchette most of all. But even anteriorly there is great tension, and some degree of forward movement.

In this condition of matters, it is not one part of the orifice that is stretched, but the whole of it; and considering the shape of the fœtal head, it is at every point probably not equally, but nearly equally, stretched. The force tending to tear it, is acting nearly uniformly at all points of the circumference of the orifice. The condition of parts may be imitated by pushing a four-inch globe through a circular orifice of a considerably less diameter, in a sheet of india-rubber. The sides of the orifice are stretched in a longitudinal direction, while they are distended.

In this crisis, the distended orifice of the vagina in the primipara does not yield, at the same time retaining its entirety. It yields, and at the same time is invariably lacerated; and I know of nothing that can modify the tearing, unless such delay as may ensure all the dilatation possible before laceration commences; and such modification of the direction of the propelling pressure as may perhaps diminish the laceration of the weak posterior parts. When laceration has begun, further enlargement of the orifice is comparatively easily attained by further laceration. Whatever other laceration takes place, there is always some at or near the mesial line posteriorly. As I have already said, I have often seen primiparæ delivered, and even by forceps, without any perineal laceration, the fourchette being entire; but I have never in such a case separated the labia and examined the vaginal orifice without finding a laceration of its posterior part.

It is quite common to hear assertions of the complete absence of laceration in primiparæ, but I have never been satisfied that, in the cases referred to, a sufficiently careful examination has been made. To do it one requires a good light, an assistant, and a sponge.

It is scarcely necessary to remark, that the laceration of the vaginal orifice is frequently the first step to laceration of the fourchette or of the perineum more extensively. But all lacerations of the perineum are not mere extensions of tears beginning anteriorly. Lacerations commencing in the vaginal orifice or in the fourchette lead to many, probably to most, perineal lacerations, which may therefore be called secondary. But there are primary and essential or independent perineal lacerations, as is proved by the occurrence of central rupture.

The inevitable posterior laceration of the vaginal orifice is not the only one that occurs. It is often alone, but sometimes there are others. There is sometimes laceration of the side of the orifice anteriorly, where the parietal tuberosity has pressed, and this tear may extend into the adjacent nympha, and bleed freely. I think the left side is more frequently the seat of this tear than the right; and this is explained by a study of the mechanism of the delivery in a first or left occipito-anterior position. In it the right parietal tuberosity is born before the left; and when the left is passing, a greater ploughing pressure is exerted on the vaginal orifice than was exerted by the right tuberosity when it passed. This is a consequence of the greater dimensions of the part passing when the left tuberosity is in the orifice than of the part passing when the right was in the same orifice.

Sometimes irregular lacerations take place, little detached flaps being left hanging. *These are* probably produced by the tension at the orifice in a

longitudinal direction, aided, perhaps, by a slight degree of friction, producing tears in a circular direction, and the subsequent detachment or pushing off of tags.

But the most important tears of this part are at its anterior margin, this special importance arising from the hemorrhage which they occasionally produce. The tear takes place before the child's head is born, and the event may be diagnosed, if a sufficient interval of time elapses, by the period of its occurrence and its anterior position at the occipital region of the fœtus, blood being found in that situation. The exact mechanism of this tear I have not satisfactorily made out. I believe it sometimes affects only the side of the urethra, and then it is truly a laceration of the vaginal orifice.

The important laceration of the vestibule, extending backwards to the side of the urethra, and forwards to the clitoris, is not common, and difficult to investigate, and on this point my observations require further confirmation. I meantime designate this a laceration of the vestibule or triangular part bounded by the nymphæ, clitoris, urethra, and anterior portion of the orifice of the vagina. If all this be correct, then this vestibular injury is not a laceration of the vaginal orifice, and is rather analogous to the laceration of the perineum posteriorly. When the vestibule is distended and developed anteriorly, as the anterior part of the perineum is posteriorly and subsequently, the place of the fourchette is taken by a fold of the vestibule. The edge of this vestibular fold tears, and the tear may extend forwards to the clitoris, or backwards by the side of the urethra. I must state that I have verified these observations by actual investigation, except the paramount one of the actual occurrence of the tear, which I have not seen at the moment of its production.

As to the important point, the order of time in which the lacerations of the vaginal orifice occur, I can give no good statement. Only it is quite sure that they all take place before the perineum is torn as an extension of the laceration of the vaginal orifice. When the perineum is so torn, the extreme tension of the whole vaginal orifice is of course annulled, and the liability to further laceration of it removed.

The inevitable laceration of the orifice of the vagina in natural labour in primiparæ takes place at or near the mesial line, in the posterior border of the orifice. It extends longitudinally, passing posteriorly along the vaginal wall, and anteriorly into the fossa navicularis. The laceration goes through a triangular mass of tissues, whose apex is the orificial margin, the part first torn, and whose base or longest side is the line of the middle of the bottom of the wound made. It is interesting during labour, to watch the progress of this tear. The first little laceration or nick may be felt to be gradually increased till the full extent of the laceration is produced. If the head retreats, the wound may be felt to be of some depth, its sides collapsing; but if it only partially retreats, some tension remaining, and the finger is passed to examine, then the wound has no depth, but presents an extended, lozenge-shaped surface, whose margins may be recognised, and whose four angles are placed, one just behind the fourchette, one higher up in the vagina in the mesial line, and the other two at the now remote but formerly conjoined parts of the margin of the vaginal orifice at which the split or laceration began. After delivery the wound resumes comparatively small dimensions; but by proper manipulation it may still be shown, by separation of the labia (in imitation of the distension by the fœtal head), to have the characters above described as present during the passage of the head.

Before concluding, I shall enter briefly on the causes of this kind of rupture, although their consideration does not form an essential feature of the subject, because the causes are nearly identical with those of ordinary perineal ruptures.

There is no doubt in my mind that, in certain cases, there is what may be called rottenness of tissue, which destroys the power of the tissues to resist laceration or bursting. In some women, and occasionally at least very markedly in the syphilitic, this condition is very easily demonstrated. It is a condition also of many inflamed tissues, and this is exemplified in the perineum.

The element of time is important in the study of causes, for there is general consent that a part rapidly dilated may give way, while the same part slowly dilated may be induced to yield and dilate without tearing or giving way. This is almost a truism, illustrated, as it may be, in all tissues, livingor dead.

The element of time cannot be fully considered without simultaneously attending to the element of force or pressure. Of course, all tearing is effected by a pressure superior to the resistance. A pressure slightly superior to the resistance may only prove itself to be so after many attempts and considerable lapse of time, and, it may be, without laceration, except what is inevitable; whereas a greater pressure may rapidly overcome the resistance, and will probably do so by producing one or more lacerations.

The element of force or pressure cannot be fully studied without taking into consideration the child's head or the body propelled against the resistance. Now, it appears to me, that the head must be regarded as a blunted or pointless wedge. A point is not required, because there is already a passage which needs only farther dilatation, not new formation. The wedge-shaped head will be more efficient in proportion as it is sharper; and this condition of sharpness will be increased by three circumstances that are subjects of frequent observation. First, it is evident that the overlapping of bones will increase the sharpness and power of the wedge. Second, the smaller the fœtal head, the sharper its wedge-like shape. This may offer an explanation of the circumstance demonstrated, or nearly so, by Hecker, that the mere size of the head is not in direct proportion to the frequency of laceration of the perineum. Thirdly, the recent caput succedaneum may act as a wedge on parts not otherwise subjected to any distending pressure, and it may also increase the sharpness of the already previously acting wedge-shaped portion. Of course, in this theory it is taken for granted that the edge of the caput succedaneum is below, or acting on the part to be dilated. Lastly, the wedge-like shape will be changed by projections such as the parietal protuberances, which will diminish the sharpness of the wedge so far as these particular parts are concerned, and increase the likelihood of laceration by these parts.

The direction of the propelling power is also to be taken into account, and may be regarded as always producing greatest pressure on the posterior part of the passage, the part which has to undergo the most extensive dilatation. Referring to the commonly used term, circle of Carus, we may point out that this direction of special pressure is a matter of course; as it is true of all curvilinear motion, the counter pressure on the convex side being required to produce the deviation from a straight course.

The part that is weakest will always, *cæteris paribus*, be the first torn. The actually weakest is probably the posterior mesial part, and, as has just been stated, it has to endure the disadvantage of being subjected to greatest pressure.

If a laceration is inevitable, treatment to prevent it can be of no avail. But all the lacerations of the orifice of the vagina are not inevitable; and that one which is so, may be treated with a view to prevent its extension beyond the inevitable degree.

Two important elements in the causation of laceration are susceptible of modification with therapeutical objects by the practitioner, namely, time and direction. The accoucheur can prevent the precipitate expulsion of the child, and its attendant evils. He can, by supporting the perineum, modify the direction of its advance, and resist any undue pressure posteriorly or inferiorly arising from the curvilinear motion of the fœtus.—*Edinburgh Medical Journal, March* 1876, *p.* 822.

92.—ON PUERPERAL FEVER.

By Dr. William O. Priestley, President of the Obstetrical Society of London.

[The following, which is part of the presidential address, is to some extent a review of the opinions expressed on the subject of Puerperal Fever during the late discussion on that subject by the Obstetrical Society of London.]

Formerly, two opinions were held concerning the pathological nature of puerperal fever. Puzos, Levret, Hamilton, and White regarded it as an idiopathic putrid fever. Armstrong, Mackintosh, and Campbell maintained that it was essentially a local inflammation, of which the fever-symptoms were merely a sympathetic consequence. Boyer, Le Gallois, and Cruveilhier endeavoured to show the analogy between the condition of a woman recently delivered and any other patient who was the subject of surgical injury, and to point out the similarity of the morbid affections to which both were liable. Cruveilhier, indeed, compared the uterus after delivery to an amputated stump, inasmuch as its muscular walls were laid bare, and at the placental spot were the gaping orifices of divided vessels. Subsequent research has proved that the uterine walls are not so absolutely denuded as M. Cruveilhier supposed; but there is no doubt as to the presence of large open channels at the placental spot, through which deleterious matters may gain a ready access to the general circulation. Following out this idea, Sir J. Y. Simpson in 1850 wrote a memoir on the analogy between puerperal and what he called surgical fever—a term much objected to by some surgeons.

Probably the best essay on puerperal fever which has appeared during the present generation is that by the late Dr. Robert Ferguson, one of my predecessors in the Chair of Midwifery at King's College. Dr. Ferguson attributed puerperal fever to a vitiated state of the fluids of the body, and regarded all varieties of local lesion as consecutive to vitiated circulation. He pointed out, what is now generally conceded, that none of the local lesions are constant, and so "none can be assumed as the essence of the malady; and, as all may exist, they may each and all be regarded as the results of a cause capable of producing them singly or conjointly." Whether, therefore, the fever takes the form of the "peritoneal," the "gastro-enteric," the "nervous," or the "complicated," where several organs or tissues are attacked at once, a poison in the blood is the one source and cause. So generally accepted is this doctrine advanced by Dr. Ferguson, that Dr. West was in some sort justified in saying, "We have not advanced far, if at all, beyond the conclusions which Dr. Ferguson laid down." In another sense, Dr. West's assertion stops short of expressing the whole truth of the case; for if we have as yet found no better explanation of the phenomena observed in connection with puerperal fever than a "vitiated state of the fluids," nevertheless a whole army of ardent workers have been investigating and adding to our knowledge concerning the nature of the poison which produces such fearful results, the various ways in which it finds its entrance into the blood, and the best methods of obviating its effects. A further impetus has been given to our knowledge of the subject by Virchow, who, after repeating the experiments on purulent infection recorded by Gaspard in 1809, and adopting the term "septicemia" from Piorry as appropriate for forms of blood-vitiation other than by pus, published his researches on thrombosis and embolism. Among obstetricians, the names of Spiegelberg, Schroeder, D'Espine, Barnes, Matthews Duncan, and others, are well known as writers on this subject, who have all contributed something to its further elucidation.

As to the way in which the poison finds its entrance into the systemic circulation, Dr. Ferguson did not overlook the peculiar condition of the interior of the uterus at the placental spot, as affording a ready mode of ingress for what might be deleterious; and he held that all wounds and bruises in the genital canal might create diseased secretions from a traumatic surface, and by absorption give rise to the phenomena of puerperal fever.

Taking, then, the outcome of the discussion in this Society, and the evidence from other sources, it may be stated that puerperal fever, or fevers which are attended by high temperature, and are commonly associated with extensive local lesions, are due to the inception of a morbid poison which vitiates the blood, and which produces a great variety of symptoms in accordance with the nature and intensity of the virus, the amount of the dose absorbed, the state of the patient when attacked, and a diversity of other conditions, which have been alluded to more or less fully by the various speakers.

As to the origin of the poison, whatever may be its nature or chemical

composition, Dr. Barnes states that it has two sources: in the one case, the virus is formed in the patient's own body as the result of initial morbid changes in some special part which infects eventually the rest of the system; in the other case, the virus is imported into the body of the patient by contamination from without. To the one class of cases he applies the term "autogenetic," to the other "heterogenetic"—synonyms which correspond to the appellations "auto-infection" and "hetero-infection" of Schroeder.

In the autogenetic or auto-infective form, septic matter is spontaneously formed within the system of the patient, as the result of disorganisation and death of tissues by a process which Virchow has termed necrobiosis. Thus, the retention of a portion of placenta, or of membranes, or of blood-clots, may become a source of septic poisoning; or a contusion or laceration of the cervix, vagina, or perineum, may become the seat of unhealthy action, and organic substances in process of decomposition are formed, which, on being absorbed, vitiate the blood. That fluids do pass from the uterine cavity into the uterine sinuses is abundantly proved; and Dr. Snow Beck has stated, as further evidence on this point, that, after the uterus has been injected by the perchloride of iron to arrest post-partum hemorrhage, the uterine sinuses have been found gorged with grumous fluid containing an abundance of iron. Dr. Savage, who has paid particular attention to the anatomy of the uterus, is inclined to doubt if poison is absorbed by its veins, and thinks the absorbents are the chief agents in this process. Dr. Tilt I understood to hold a like opinion. Dr. Graily Hewitt, Dr. Snow Beck, and others, have enlarged on the great facility afforded to the absorption of septic fluids by an undue relaxation of the uterine walls after delivery, and hence deduce the great importance of thoroughly promoting its contraction upon the expulsion of the placenta. Dr. Hewitt goes so far as to say that he has never seen a case of puerperal pyæmia in which this relaxed condition of the uterus was absent. Dr. Beck attributes the influence which has usually been ascribed to hemorrhage as a predisposing cause of septicemia, entirely to relaxation of the uterus as the prime factor; but this, I take it, is a somewhat too extensive statement, as Magendie clearly proved that, with empty vessels, absorption is very rapid in other parts of the body, as well as the uterus. Dr. Tilt attaches great importance to fetid lochia, and their absorption, as factors in producing the febrile affections of the puerperal state. He believes they are not only more frequent than commonly supposed in ordinary cases, but that scarlatina, or other zymotic disease in a puerperal woman, may cause the lochia to become putrescent and virulent: their absorption then adds a fresh peril to the case, and accounts for the serious character of the complication. And if absorption of decomposing or putrescent materials formed in the patient's own body is to be feared when there is no breach of continuity other than that caused by the separation of the placenta, how much greater may become the danger when any laceration has taken place in the genital canal, which exposes a wounded surface to external agencies! Mr. Callender has reminded us of a truth formerly indicated by Benjamin Gooch, of Norwich, that there is nothing more irritating or acrid than the fluid of a wound itself immediately after operation, and if this be pent up, it may become a source of auto-infection. Mr. Spencer Wells has become thoroughly conversant with this fact in practising ovariotomy, and he drains off from the cavity of the peritoneum the acrid fluid which would otherwise inevitably poison his patient. But Mr. Callender has further informed us that in surgical practice "a patient may be tolerant enough of decomposition which may be set up by a wound in his own body, but will be intolerant of poison conveyed to him or her from any other wound." If this be true in surgery, *à fortiori* it is true in obstetrics, and demonstrates how essential it is to the safety of his patient that the accoucheur should keep his fingers free from all contamination.

Turning to the heterogenetic or hetero-infective forms, in which the virus is imported from without, the inquiry suggests itself, Whence is derived the poison which, introduced into the system, has such potent results? Is it always one and the same, or are there several poisons capable of producing different diseases in non-puerperal patients, but provoking generically the

same results when introduced into the body of a woman recently delivered? It is this part of our problem which seems to me most difficult to solve; and yet upon a correct solution of it probably depends the reconciliation of many conflicting views, and certainly the adoption of proper prophylactic measures for preventing the spread of puerperal fever.

If the evidence be true in reference to the exanthemata, it is even more forcible, and borne out by a greater concurrence of opinion concerning the serious peril encountered by the puerperal woman when exposed to the poisons of erysipelas, diphtheria, and typhus. Mr. Wells and others have mentioned instances in which there could be no doubt that puerperal fever was produced by direct or indirect communication with erysipelas; and other Fellows had painful experiences to relate, had time permitted, of puerperal deaths caused unwittingly by going from patients having erysipelas to the lying-in room. The connection between the two has long been noticed; and observations have accumulated with such force and frequency as to constitute absolute proof of close affinity. Many new-born children have died of erysipelas whose mothers were the subjects of puerperal fever; and instances have not been rare where the medical man attending a puerperal fever patient has from her contracted erysipelas, and died also.

My friend Dr. Fordyce Barker, who contends strenuously for the specific character of puerperal fever, admits in his larger work, and also in a recently published lecture, that the close relation, or what he calls the "solidarity," between puerperal fever and erysipelas is conclusively settled. He considers, however, that, although they are interchangeable, they are distinct diseases. I fear that logically this acknowledgment of interchange of symptoms is somewhat adverse to the theory that identity of cause will necessarily produce identity of result. In recognition of the same natural relation, Virchow speaks of puerperal fever as *malignant puerperal erysipelas*.

There seems to be literal truth in the remark made by Dr. West, that "there is not one single solitary cause to which we can refer the symptoms of puerperal fever: that it occurs now from one cause, now from another." With equal truth, also, it may probably be asserted that there is not one puerperal fever, but several, arising from a diversity of causes. The term puerperal fever has been somewhat loosely but habitually applied to all diseases of lying-in women which were attended by febrile symptoms and tended to a fatal termination. In attempting a more accurate pathology, it is well to bear in mind that fever is only a symptom of disease; and that we have to find out what is the underlying disease, of which the fever is but the indication. Perhaps the best practical classification of puerperal fevers which has been suggested, in accordance with our present knowledge, is: 1. The ephemeral forms which depend on some transient cause; and the graver class, divided into (2) the auto-genetic or auto-infective form, and (3) the heterogenetic or hetero-infective, in which the poison is imported from some zymotic or other infective source, and the origin of which can be traced. Notwithstanding this classification, there will always be cases the origin of which it is difficult or almost impossible to detect. These must necessarily form a class by themselves, until further knowledge enables us to assign to them their proper place.

For a long time, the contagiousness of puerperal fever was disputed, and in Paris writers and practitioners remained unconvinced of its contagiousness long after it had been conceded elsewhere. In our day, the direct proofs of its contagious quality have accumulated to such an extent, that to disregard them in practice would amount, on the part of a medical practitioner, to a plain dereliction of duty. So far as some of the forms are concerned, however the attack may have originated, if it be but a single case, it may become the focus and centre of propagation to other women. And, of the several ways in which the subtle poison may be conveyed to the lying-in woman, none is more certainly proved than that it may be conveyed by the hands of the practitioner in making vaginal examinations. But this *is not* the only way. It may probably be communicated through the *clothes*, instruments, respiration, or even the secretions of the medical *practitioner*, midwife, or nurse. That it may be so spread, we have ample evi-

dence, if we look back to the records of Gordon, Armstrong, Gooch, Ramsbotham, and others. Dr. Robertson, of Manchester, gives one of the strongest instances possible. In the space of one calendar month, a midwife attended twenty cases belonging to a lying-in charity; of these, sixteen died of puerperal fever. Other midwives of the same charity attended 380 cases in the same district and at the same time, and none of these were affected by the disease.

There is very cogent collateral evidence towards proof that the blood of a puerperal patient may be infected by other channels than by the genital canal. It is certain that puerperal fever may begin in a patient before her delivery. Dr. Barnes's statement that he has been conscious of absorbing poisonous and offensive emanations from patients with putrid discharges, and that he has suffered from shivering, diarrhœa, and foul breath as the result, affords a very strong presumption that an attendant may go about charged with an infectious disease, and convey an atmosphere about him which shall be most deleterious to susceptible patients. There is a very ingenious exposition in reference to this matter in Dr. Tyler Smith's "Manual on Obstetrics," and he strengthens the position by reference to cases in which pregnant women who have had small-pox in childhood, and are proof against infection, have nevertheless, as in Dr. Corde's case previously mentioned, on being exposed to the poison, conveyed the disease to the fœtus *in utero*.

My friend Dr. Moir, a former President of the College of Physicians in Edinburgh, has sent me the following short history, which seems to indicate that a diseased child *in utero* may infect the mother with a form of pyemia which may be transmitted on to other lying-in women. I quote his own words:—

"Mrs. H., who had had several previous very easy confinements, had threatenings of labour on a Monday. Instead of a rapid delivery, as usual, she had slight pains and much malaise all the week, and was confined latish on the Saturday evening. Child above the average in size, about 9 lbs., fat and healthy-looking. On Sunday forenoon the child died very unexpectedly and without apparent cause. On examination next day, it was found that one pleural cavity was filled with thick purulent matter, the lung being forced back and, of course, undistended with air. The mother never had milk, as usual, fevered with much general pain, and afterwards had all the symptoms of puerperal fever. Large abscesses formed in various parts of the body, some being opened, which gave partial relief. They were on the legs, arms, chest, and a very large one implicating almost the whole dorsal muscle. This one was not opened. The pyemia in this case was evidently existing before delivery from the symptoms, and from the child's being affected. So much for Mrs. H.

"Two hours after her child was born, I was called to Mrs. W., who had had several children: easy cases. She was ill only two hours, took rigors on the third day, and died about six days after delivery, with all the symptoms of puerperal fever. Two hours after Mrs. W. was confined, I was called to Mrs. F., who also had an easy delivery; had all the symptoms of puerperal fever; but recovered after a hair-breadth escape, not recovering for six months. Observe: the three cases were all over within eight hours. I undoubtedly carried the infection from Mrs. H., whom I had been seeing constantly during the six days she was ailing. She survived the delivery about twelve days; Mrs. W. only about six."

But are all forms of puerperal disease attended by febrile disturbance equally infectious? This is an inquiry which bears with moment on the necessity for precautions on the part both of doctors and of nurses, and the question is constantly being raised, Should a nurse who has been attending this or that modification of the disease be permitted to pass on at once to the charge of some other expectant patient? On this point, Dr. Hicks says "that the majority are contagious, I have no doubt; whether all are so, I am uncertain. I am inclined to think that those forms derived from the zymotic diseases are the most so; those from the self-generated kinds are least so." Dr. Routh concludes that some forms are contagious and others are not so; and Mr. Wallace believes that it is "what would be called the

pyemic cases which are non-contagious." Dr. Barnes, again, states that "the autogenetic forms proper to not appear to possess active powers of propagation;" and Dr. Fordyce Barker, concurring in this remark, regards this difference of contagious property as one of the proofs that puerperal pyemia or septicemia are generally different from true puerperal fever. I take it, then, that opinions coincide pretty generally that some forms are highly contagious and infectious, others are less so; and it is probable that those arising from extraneous sources are most contagious; those from poison generated in the patient's own tissues least so; or perhaps I may put it in a somewhat more practical form, as a broad rule for guidance, at the risk of being less scientific and precise, that the most acute forms, running to a rapid termination, are most likely to be highly contagious; those which run a more chronic course, and are attended by secondary complications, are least so. Nevertheless, as we do not know yet that even the chronic cases may not in a minor degree be infectious, it behoves us to exercise caution in attending these cases, to purify nurses who have been in charge, and, above all, to be careful not to convey any of the discharges to other lying-in patients.

The process of parturition should be conducted with the view to the genital canal of the woman being exposed to the effects of irritation, continued pressure, and laceration, as little as may be possible. After the birth of the child, a full and perfect contraction of the uterus should be secured, by seeing that the organ is not emptied too suddenly, and that the hand follows the fundus down from above as its contents are expelled. Subsequently to delivery, the various known methods should be practised to promote the contraction of the walls of the womb and the diminution of the uterine cavity; and any clots forming, should be removed from time to time during the hour after removal of the placenta. It is superfluous to say that the placenta should be extracted in its entirety, when possible; and great care should be taken not to leave any detached portions adherent to the uterine walls. The same precautions should be observed, when practicable, in cases of abortion. If any considerable laceration of the perineum have taken place, the edges of the wound should immediately be united by sutures, not only for the purpose of restoring the perineum, but also to prevent contamination of the wound by putrid discharges. In the case of other wounds in the vagina or cervix uteri, especial care should be taken to keep them clean by repeated injection, and to leave as small a raw surface exposed as may be possible. In all cases where the lochia are in the least degree offensive, the vagina should be well injected with Condy's fluid and water, or other innocuous disinfectant, twice in twenty-four hours, or oftener if necessary; and the injection may be carried into the uterine cavity, if it be much distended, and there is a suspicion that it harbours fetid contents. The injection of the womb-cavity, however, should be conducted slowly, carefully, and without force. These uterine injections were practised long ago by William Harvey, and there is concurrent testimony in this and other countries of their marked utility in abating the symptoms even when puerperal fever has apparently set in.

Next in importance is to take care that there is no fecal accumulation in the bowels, and to recollect that the existence of previous diarrhœa may be the indication that retained masses are lying in the intestines and producing irritation there. Dr. W. T. Greene has alluded to this during the debate; and it must be within the experience of many how acute febrile symptoms, accompanied, it may be, by delirium or incipient mania, have passed away with a proper evacuation of the bowels. I may put it, in short, that, to promote recovery after parturition, every direct or reflex source of irritation should be removed, pure air and water insured, absolute cleanliness observed; and perfect quietude, mental and physical, should be enjoined. Nursing the child should also be recommended when the mother's condition permits, as puerperal ailments have been observed more frequent in women who have not suckled their children.

To secure the isolation of a lying-in woman from noxious influences which may be communicated to her from without may be difficult, and in some cases perhaps impossible; but as Mr. Callender has informed us that surgeons

have learned to banish, for all practical purposes, those affections which may be termed septicemic from surgical wards of hospitals, so I cannot help thinking that the accoucheur will in time succeed in preventing the like affections in puerperal women, so far, at least, as the heterogenetic cases are concerned. We are all agreed as to the absolute necessity of preventing, directly or indirectly, any communication between cases of erysipelas and puerperal patients. We are agreed also as to the necessity of the midwifery practitioner avoiding all post-mortem examinations. His hands should avoid all contact with specific poisons or septic materials; and if perchance his fingers have touched anything suspicious, he should at once carefully and thoroughly disinfect them. The necropsies which seem most baneful are of those bodies which have recently died of erysipelas, peritonitis, zymotic disease, or any other inflammatory and febrile affections; and in such instances the accoucheur should not even be present in the room when the dissection is made, as, though he decline to touch, yet his person and clothes may become infected by the poison. There may possibly be a doubt whether one who dissects bodies altered by decomposition or antiseptic injections, as they are commonly found in the dissecting-room of medical schools, is so liable to contaminate a puerperal patient as he who makes a necropsy soon after death. Semmelweiss, however, believed that animal matter in a state of putrefaction would cause puerperal fever, and immediately lessened the mortality, during the fearful epidemic of puerperal fever which raged in the Vienna Hospital in 1846 and 1847, by obliging all dissecting students to wash their hands in chlorine or chloride of lime before making vaginal examinations. Impressed by Semmelweiss's views and opinions, I endeavoured, during my occupancy of the chair of Obstetric Medicine at King's College, to prevent students from frequenting the dissecting-room and post-mortem theatre from attending midwifery cases, and the result was a very small mortality in the outdoor maternity charity.

This care about absolute cleanliness of the hands in attending labours should extend even to occasions when a medical man has had digitally to examine patients suffering from offensive discharges either proceeding from the surface or from the interior of the body. We have heard in this discussion that the discharges from cancer may produce fever in a lying-in woman; and this is probably true of other putrescent discharges. I have had grave anxiety, extending over some weeks, about a patient after her delivery; because I had gone straight from an instrumental case where labour had been so protracted that febrile symptoms had set in, and the passages had become influenced, so as to pour out an irritating muco-purulent discharge.

When a medical man has a bad case of puerperal fever in his own practice, or is required to see one in consultation, he should certainly not go direct to another midwifery patient without first changing his clothes, besides careful ablution of his hands; and he will be all the safer in his ministrations if he adopts some of those precautions mentioned by Dr. Swayne and others, such as using a Turkish bath, or the more radical measures for disinfection recommended by Dr. Wynn Williams, and for the details of which I may refer to his speech.

Many chemical substances have been recommended to be added to water for purifying the hands: iodine, chlorine and its compounds, sulphurous acid, cyanide of potassium, carbolic acid, and the permanganates. It matters not which agent is employed, so long as it is used carefully and efficiently; and if it be necessary to disinfect clothing, this is readily done by exposing it in an oven to a high temperature, for which many upholsterers have a suitable arrangement. With all deference to Dr. Matthews Duncan, I have no doubt that every medical practitioner who earnestly desires to promote the welfare of his patients and to keep himself blameless should at once abstain from attending fresh cases of labour when one or more of those recently delivered by him have died with acute febrile symptoms, or are still so ill as to require his constant visits. When, indeed, there is the remotest suspicion that he may convey the poison in his own person, he should not incur the risk of disseminating it. How long he ought to absent himself from midwifery practice, is yet a moot point. Dr. Swayne thinks a medical

man should seclude himself for a week only; others think a month hardly sufficient. The remarkable experience of Dr. Huntley, of Yarrow, led him to believe that he actually generated poison in his own body, as the result of some faulty process, which he communicated to his patients. Taking all the circumstances into consideration, I am disposed to recommend a week's seclusion after regular attendance has ceased on a single puerperal fever case. When a series of cases have occurred in the practice of any one medical man, he should absent himself from midwifery practice for a month at least. During either the short or the longer interval of seclusion, the means for disinfection should be fully carried out.

Finally, I have to say a word or two as to the propriety of attending patients suffering from scarlet fever or other zymotic disease, and lying-in women, at the same time. After what has been said in this debate, I cannot expect the same accord of opinion as on other parts of the ground I have gone over; but I would earnestly beg those who have as yet had so favourable an experience, when attending the two sets of patients conjointly, to ponder well what has been said by others on the reverse side of the question. It cannot be expected that men in general practice, who may be in charge of a scarlet-fever or small-pox patient, shall at once relinquish all midwifery practice for the time being, because zymotic diseases are so prevalent that this would practically preclude their attending confinements altogether, or make their attendance on midwifery patients so irregular as to be unreliable. Nevertheless, in view of the dangers which have been indicated by various authorities, albeit their experience may seem to point to different conclusions, they are bound to exercise vigilance, lest perchance they slip into a pitfall unsuspected by them. In seeing an ordinary case of illness, a medical man rarely stays sufficiently long in the sick-room to concentrate any considerable dose of contagion about him, and the after-exposure to fresh air in passing from house to house no doubt usefully dissipates any smaller quantity. I would suggest, however, to those treating infectious cases, and liable at the same time to be summoned to cases of midwifery, or who may be in attendance on puerperal women, that they should not stay long in the sick-chamber; not undertake the duties of nurses, as Dr. Duncan puts it; that they should see puerperal patients before seeing infectious cases, and never go from the infectious case direct to the lying-in room, without changing clothes and the most careful ablutions. Some doctors change their clothes and wash with a disinfectant whenever they have seen infectious cases. Whatever either will, or may, conduce to the well-being of patients, will, I am sure, not be regarded as either too irksome or troublesome by any member of our profession.—*Obstetrical Journal, Feb.* 1876, *p.* 741.

93.—ON THE USE OF THE FORCEPS AT THE ROTUNDO LYING-IN HOSPITAL, DUBLIN, DURING 1875.

By Dr. GEORGE JOHNSTON, Ex-Master of the Hospital.

Alluding to the question of the use of the forceps, Dr. Johnston said: "There were 113 cases where we considered it advisable to deliver with the forceps, and 83 of these were primiparæ, or more than two-thirds, giving birth to 53 boys, 51 of whom lived; two were dead at birth; 30 were girls, 27 of whom lived; 1 was dead at birth. 75 mothers recovered; 8 died, 6 being cases of seduction, fretting; 2 cases of peritonitis; 30 were pluriparæ, in which 16 boys were delivered, 14 of whom lived; two were dead born; and 14 girls, all of whom lived. 28 mothers recovered, 2 died, 1 of pleuritis, 1 of fungoid tumour of the uterus, with fatty heart; making a total of 69 male children born, 65 being alive at birth, 4 of whom died; 4 were dead born. Thus, 61 males were saved, and 44 female children born; 43 were alive at birth, 2 of whom died, and 1 was dead born. Thus, 41 female children were saved, making a total of 102 children saved who, in all probability, would have

been lost if left to the natural efforts; 103 mothers recovered, and 10 died. The forceps which we at first used were of the straight form, both long and short, generally called Beatty's; but finding on frequent occasions that they slipped, particularly when the head was above the brim, or when it was at all tightly wedged high up in the pelvis, and were consequently inefficient, we were obliged to have recourse, about five years since, to the double-curved variety of Barnes, and we have great satisfaction in saying that the more we employ them the more reason we have to be perfectly satisfied with them, inasmuch as we have proved them to be an instrument both safe, easy in their application, and most efficient in their powers of extraction, and at the same time not compressing the child's head to any injurious extent, and perfectly available, whether the head may be above the brim, in the brim, or in the cavity; in fact, we see no necessity for using any other, as they can be introduced by one experienced in their application as easily, if not more so, than the straight variety in all cases; and, as a proof of their not producing any injurious effect on the child, instances are given in our former reports where it has been born alive and lived, although the force used to draw the head through the contracted strait was enormous, and the length of time occupied by the operation was very great. One case may be mentioned as serving for an example, which occurred in a woman in her ninth pregnancy, where there was an exostosis of the right sacro-iliac synchondrosis, preventing the head from entering the brim, and where it took three-quarters of an hour to extract the child, whose head, when born, presented a depression occupying the pominence of the left parietal bone of over 3 inches long and 1¼ inches broad, and at least ¼ inch deep. Yet that child, a boy, weighing 7 lbs., 12 oz., lived, and was carried out by its mother quite lively and well on her being discharged on the eighth day. Now, if we deduct the 40 abortions from the total number of deliveries recorded as having taken place in the year, it will leave 1,025, which, divided by 118, the number of times the forceps were used in that period, it will be seen that they were had recourse to once in about every 91-11th. Some may cavil at the system we have adopted, but the further we pursue the practice the more we see the advantages arising from it in preventing serious consequences to both mother and child—the mother being saved from lengthened agony, prolonged too often to a serious extent from the effects of exhaustion, rendering her liable to inflammation of the soft parts, with all its direful results, such as sloughing and its consequences, fistula, pyæmia, peritonitis, &c., and the child's life preserved by not allowing it to encounter too long the danger resulting from the protracted pressure, both by the compressing of the head in the pelvis and the evil results of the contraction of the uterus round the child and the placenta, thus cutting off the supply so essential to its fœtal existence. In reply to the objection that has been raised by some—viz., that the forceps is a dangerous instrument, and as a proof to the contrary, I may mention that of the 752 cases that have been delivered within the last seven years, in no one instance was injury inflicted by the instrument on the soft parts of the mother. In fact, by using proper precaution in their appliction, by bearing in mind the different axes of the pelvis and the condition of the passage and cervix uteri, and by introducing the blades with the greatest gentleness in accordance with the direction of these axes, and by taking every care to avoid catching the points of the blades in the cervix, particularly when it is not quite fully obliterated, and when they are applied by making the traction in the proper direction, *i. e.*, in accordance with the amount of descent at which the head may have been arrested in the pelvis, and by continuing it in the axis of the pelvis your extractive force has brought it to, which latter precaution should be particularly attended to, and as soon as the head has been brought sufficiently forward to the outlet, by withdrawing the blades, as our invariable practice is, and has always been, and completing the delivery in the ordinary way, there cannot be, in the hands of the skilful practitioner, any injury produced. And no doubt whatever exists that such practice tends to the more favourable convalescence of the patient. Now, although far from encouraging or inculcating "meddlesome midwifery," as it has been termed, and no doubt

in some instances not without reason, as this practice should never be adopted merely in order to save our own time, it should alone be had recourse to when the life of the mother or that of her offspring is in jeopardy. The more we see of early interference and the benefits arising from it, the more we are induced to persevere in it. It has been insinuated that it is a most dangerous practice, and therefore it would be wrong to inculcate it into the mind of the general practitioner; but although no doubt it would be so in the hands of a careless or unskilful person, should that be a reason, may I ask, why the skilful obstetrician should not adopt a measure attended in his hands with perfect safety, by which the many hours of suffering agony of the mother is spared and the life of her offspring preserved, which, under the peculiar circumstances of the case, would otherwise be endangered, if not altogether lost? It might as well be said you should not attempt to take up the subclavian, tie the external iliac, perform lithotomy, or any other of the operations in surgery, because, forsooth! such would be dangerous or unjustifiable in the hands of the unskilful. We have only to add that it has been, so far as our experience goes, the means of saving many lives, both of mother and child, and therefore we have every reason to consider ourselves not alone justified in the continuance of it, but in also recommending its practice to others. At the same time, while doing so, we warn all, as we have always done the student in the class-room, of the dangers to be avoided in using the instruments, not only in the first stage of labour, but in every case, where, even although the os may be fully dilated, the absolute necessity there exists of using the greatest caution and gentleness in the introduction of the blades, in their application, and when adjusted in the mode of extraction.—*Medical Press and Circular, Jan.* 19, 1876, *p.* 43.

94.—CASE OF ARTIFICIAL OCCLUSION OF THE VAGINA FOR THE CURE OF PROLAPSUS UTERI.

By Dr. James Dunlop, Surgeon to the Glasgow Royal Infirmary.

Margaret F., aged forty-eight years, was admitted February 20, 1875, suffering from prolapsus uteri of fifteen years' standing, and attended with the usual symptoms—viz., a sense of fulness in the pelvis, pain in the back, with some irritation of the bladder and rectum. The uterus was resting on the upper floor of the perineum, and protruding somewhat through the vulvæ. It could be easily replaced on the patient assuming a recumbent position. Various kinds of pessaries had been employed, but the patient was unable to wear any for a length of time. Other means of support had also been had recourse to, but without avail. An operation was therefore proposed, to relieve the patient of the discomfort with which such a malady is necessarily attended. Its object was to narrow the vaginal orifice by uniting the opposite portions of its walls, so as to bring forward the perineum, as it were, to act as a natural cushion to the prolapsed parts. A strip of mucous membrane an inch and a half wide was dissected off from half an inch below the meatus on one side to a corresponding point on the other. The two raw surfaces were now brought into close apposition, and kept there by means of quilled sutures. The catheter was passed frequently, and the bowels were kept confined by the administration of opium. The parts speedily united, and the patient was dismissed well on April 30, 1875.—*Medical Times and Gazette, Feb.* 26, 1876, *p.* 223.

95.—A NEW METHOD OF PREVENTING THE SECRETION OF MILK IN THE FEMALE BREAST.

By Dr. John William Lane.

I have for more than ten years employed the following method to prevent *the secretion* of milk in the breasts of women who may have had still-born *children*, or who, after having nursed their child for a few months, found it

necessary to wean it. It is perfectly clean and painless as far as my experience goes, and as such I beg to recommend it to the notice of my medical brethren.

We will take for instance the case where the infant has been born at the full period, but is dead, or dies within a few hours of its birth. The milk makes its appearance in the breasts generally about the second day, sometimes longer, and sometimes it is ready when the child is born, and in the case of still-born children my experience leads me to think that in such cases it makes its appearance earlier than when the child is born alive. My plan consists in taking a piece of emplastrum adhæsivum of about ten inches square, round the corners, cut a hole in the centre for the nipple, then from the centre of each corner make a straight cut towards and within two inches of the centre hole; having now got it ready, let the patient lie on her back, her body being perfectly horizontal; warm the plaster and place it over the breast, then strap one of the lower corners down first, draw the opposite one tightly upwards and fix it in its place, then the other lower corner, and lastly the opposite upper one, having drawn it sufficiently tight first; now take a piece of plaster two inches wide and about sixteen or eighteen inches long and put it on from below and outside the breast, across close by inside of nipple, and fasten the end over the clavicle; another piece may also be put on in an opposite direction, it being drawn over the shoulder. Of course, in cutting the plaster and strips the size of the breasts must be taken into consideration, there being so much difference in the size of female breasts.

The above plan I always follow when one of my patients wish to dry the milk, as they usually call it, or where they are compelled to do so either from the death of the child or any other cause. I also am certain strapping will prevent mammary abscess if resorted to in the earlier stage; I at least have found it do so in many cases.—*Medical Press and Circular, Feb.* 16, 1876, *p.* 131.

96.—"NO MORE OVARIOTOMY."

Under the above startling title we find a note in the Surgical Centralblatt for Feb. 12, taken from the Wiener Med. Presse, 1875, No. 52, by Dr. Semeleder. About two years ago he was informed that a lady of his acquaintance suffering from an ovarian cyst, who had been much relieved in Dresden by acupuncture (? galvanopuncture), had been ultimately cured in Vienna by the same treatment. Since that time he has tried it in three cases:—

1. A young lady, aged eighteen, who had a soft fluctuating ovarian tumour, originating on the left side and extending three centimetres above the umbilicus, was subjected to galvanopuncture. In four months the diameter of the abdomen two inches below the umbilicus was reduced from ninety-six centimetres to ninety-two centimetres; and in two months more the cure was completed.

2. A lady twenty-four years old, and the mother of two children, had a tumour in the lower part of the abdomen on the left side, as large as the head of a child two years of age. When she had been under treatment for two months the patient was cured, the remains of the cyst being hard, and of the size of a small apple.

3. A woman forty years of age, with a tumour reaching up to the umbilicus, had so far recovered at the end of six weeks of the treatment that its continuance was considered unnecessary.

No unpleasant consequences occurred in any of these cases, and none of the cysts have refilled. The author considers that the action is the same as that which occurs when the poles of a battery are placed in an albuminous fluid—viz., clotting and thickening at the positive pole, and liquefaction at the negative. He considers the method equally applicable to multilocular and unilocular cysts. He does not give an exact account of his method of procedure, but each sitting was of short duration. He anticipates equally favourable results in the treatment of hydatid cysts on this plan.— *Med. Times and Gazette, March* 4, 1876, *p.* 256.

97.—ON THE USE OF NITRIC ACID AS A CAUSTIC IN UTERINE PRACTICE, AND ITS SUPERIORITY AS SUCH TO NITRATE OF SILVER.

By Dr. Jas. Braithwaite, Lecturer on Diseases of Women and Children at the Leeds School of Medicine; Assistant-Surgeon to the Leeds Hospital for Women and Children.

I believe that, in cases in which the use of a caustic is necessary for the cure of ulceration or erosion of the os and cervix uteri, that which is generally, but not invariably, the most suitable for our purpose is nitric acid.

I do not propose to enter upon the disputed question of the pathological importance of these affections, nor upon any other point in their treatment, such as the primary relief of congestion or inflammation. I cannot, however, with Dr. Routh (Transactions of Obstetrical Society of London, vol. xi., page 94), look upon the use of caustics as solely for the purpose of relieving congestion by means of the discharge produced, in which case nitric acid would be useless, for it produces no discharge. I find that by curing the ulceration we cure the congestion, generally, but not always without other treatment.

I think it will be admitted that nitrate of silver is the caustic in most general use, and that it is unnecessary I should take up your time by references to writers on the subject to prove this.

The great fault of nitrate of silver for the purpose in question is the fugitive nature of its action. Its influence seldom extends beyond five or six days, even when rubbed upon and held in contact with the parts. Again, nitrate of silver is more a stimulant than a caustic, causing extreme turgescence of the capillaries immediately below the surface actually influenced. This is evidenced by the frequency of hemorrhage, often sufficient to obscure the parts before it has been removed from contact with them. The escharotic action of nitrate of silver, such as it is, is too superficial to destroy the diseased surface, and by the production of a slough to stimulate the parts beneath to the healthy activity necessary for its separation. At the second examination, we often find the ulceration, or erosion, very little, if at all, altered in appearance.

The action of nitrate of silver is thus defective for our purpose—1, in duration; 2, in quality; and 3, in degree; and these faults must be atoned for by its frequent reapplication. This necessitates each time the use of the speculum, distasteful alike to patient and to attendant. I believe in this really lies the source of the opinion held by some eminent men that these diseases require little or no local treatment. Our opinions are often unconsciously influenced by our wishes. Dissatisfaction with nitrate of silver has caused the trial of other applications such as sulphate of zinc points, nitrate of mercury, potassa cum calce, ignited charcoal-points, and electric heat, all of which either have some disadvantage, or are ineffectual. I believe nitric acid to possess these advantages as a caustic in uterine practice. It requires no special preparation, and is always at hand; it cannot affect the system as may a salt of mercury; it does not spread like potassa cum calce, nor is its action so deep; it produces little or no pain, and no hemorrhage. These advantages are trivial compared with the fact that, when it has once been properly applied, in the majority of cases no further interference is necessary, and thus that opprobrium of our branch of the profession—the frequent use of the speculum—may be done away with. When the second examination is made, it should be after the lapse of a month; and it will then sometimes be found that there is a small spot requiring a fresh application of the acid, but often the sore is seen to be quite healed, or healing satisfactorily. The eschar separates slowly, and the resulting sore has a very strong tendency to heal. The fresh mucous membrane which forms is not cicatricial in appearance, and, when healing is going on satisfactorily, has a sharply-defined edge, and, being of a pale rose colour, contrasts strongly with the bright red colour of the sore. The contraction is greater than follows the use of any other caustic; but this is a great advantage, for, on account of the *relaxed* state of the tissues, it is just what is required to insure the permanence of the cure. The acid is best applied by means of a small and tightly-

olled piece of cotton-wool, which is to be placed by means of an ordinary peculum-forceps in contact with successive portions of the surface, until the whole is covered with a white eschar. In a case of chronic endocervicitis, he acid should be applied to the interior of the open cervical canal; and, if t be not open, the case is not one suitable for this treatment. The contraction which accompanies healing is only to a healthy and natural state, provided the caustic has been used with ordinary prudence. I have never seen anything but good follow its use, and the ease with which a chronic case of cervical catarrh with ulceration or erosion may be cured by it is something marvellous. The bulk of my cases have been hospital out-patients, and the comfort the use of nitric acid has been in their treatment is very great, both in certainty of result and in saving of time. Without local treatment very little can be done for these patients, for hygienic treatment is generally impossible, and medicinal treatment alone is useless. I shall not take up your time by details of cases, although I have copious notes of about forty, as by trial of the remedy you will soon prove your own opinion of its value.

The use of nitric acid as a caustic is so familiar to us all, especially in diseases of the rectum, that I have had some hesitation in bringing the subject before you, and should not have done so, but that I believe it is only used by two or three medical men engaged in the treatment of diseases of women. It is mentioned incidentally at the conclusion of a paper by Dr. Lombe Atthill, upon its application to the interior of the uterine cavity, that he uses it habitually in the diseases in question; and Dr. Roe, of Dublin, in an analysis of the cases of uterine disease (Dublin Journal of Medical Science, August, 1872), relates a case of extensive ulceration in which he employed it. Mr. Robert Ellis has recommended the use of a saturated solution of nitrate of silver in nitric acid; and I believe Dr. Bennet has mentioned its use. But these writers are exceptions to the general rule. It is not mentioned by Tilt in his admirable work on Uterine Therapeutics, nor by any other of our standard authors upon diseases of women, all of whom recommend nitrate of silver, or mention its use as the usual practice.—*British Medical Journal, Nov.* 13, 1875, *p.* 609.

98.—ON MAMMARY TUMOURS.

By Dr. George Buchanan, M.A., Professor of Clinical Surgery in the University of Glasgow.

[After some preliminary remarks Dr. Buchanan relates the following case.]

This woman is forty years of age, unmarried, of spare habit of body; and hitherto she has enjoyed good health. The catamenial function was regular from its appearance up till eighteen months ago, since which time it has altogether ceased, without any cause. Three months ago, she became aware of a tumour in her right mamma. Her attention was drawn to it by feeling her dress a little tight. There was no pain when she discovered it. During the last three months, it has increased in size, and the growth has been more rapid of late, especially during the last two weeks, following on a slight blow on the back of a chair; though, remember, I do not say that was the cause. In the right mamma, occupying the upper portion, there is a tumour which is irregular, nodular, about four inches in diameter, and to the feel about three inches thick. The tumour and the gland in which it is imbedded move freely upon the subjacent structures, and are not in any way adherent. Immediately above the nipple, the skin is partially adherent to the tumour; but towards the circumference it is freely movable upon it. The nipple is slightly retracted, but not to any extreme degree. The axillary glands are perfectly free from implication. So far as the patient's sensation is concerned, there is no difference between the two mammæ, except what is produced by the weight of the tumour on the right side. I may say nega-

tively that there is no shooting or burning pain. The tumour is, as I have said, slightly irregular in form, and hard to the feel.

Such is the case, and a very valuable case it is to learn from; because, although I have no doubt in my own mind as to the nature of the tumour, if you take any work upon the subject, and examine into the symptoms there given of scirrhous mamma, you will find that, in a great number of important points, the symptoms are here absent; yet there is not the slightest doubt that this is a case of scirrhous mamma; and that, I hold, is the value of clinical observation as compared with doctrinal teaching. If a surgeon go and examine a case of this kind with his mind filled with the tabular statement of symptoms, the absence of many of the most important of these symptoms might lead him to believe that it was not a case of scirrhus. But by bringing the patient before you, and making her tell, in her own simple way, all that she knows and all that she could tell you in private, and by examining the tumour simply and regularly before you, and by learning everything about it, we are driven to the conclusion that in practice we must meet with a great variation from the ordinary run of cases as described in books.

What is the nature of this tumour, and what should be done in the circumstances? Now, I do not intend to give you a list of all possible tumours, or of all growths in the mamma or other parts of the body; but I think it is very important to put before you a clinical view of the subject. Tumours of the mamma are of two great classes—the malignant and the non-malignant. Simple or non-malignant tumour consists of the collection into one spot of one of the normal constituents of the body. Thus, confining our attention to the mamma, we may have fatty tumour, fibrous tumour, adenoid tumour; and these are simple, because they consist of the same substances which form normal parts of the body. Malignant tumour, on the other hand, is formed of a collection of substances which are a new growth in the human body; of abnormal substances which do not exist in the body of the living man. That is the essence of the distinction between the two kinds of tumour. If you examine the minute structure of the simple non-malignant tumour, you will find it to consist of a modification, it may be of one of the normal tissues of the body; if you examine the malignant tumour, you will find it to consist of tissue of which there is no example in the human body.

With regard to the mode of growth, simple tumour extends by increase of bulk, displacing, pushing aside, perhaps causing to be absorbed, the tissues with which it is surrounded. Malignant tumour increases in bulk by incorporating with itself the adjacent tissues, and gradually converting them into itself. Further, simple tumour is for the most part isolated and incapsulated, contained in a membrane which is called its capsule. Real malignant tumour has no absolute defined membrane, but invades all the neighbouring tissue without any well marked margin. The ordinary name of cancer is well given to malignant tumour, because it gradually draws into its centre all the neighbouring parts, so that in the end it extends without limitation.

Now it is very important for you to mark well a few of these characteristics, because upon them will depend the opinion that you will give with regard to the propriety or impropriety of operating upon a patient. It is perhaps unnecessary to go further just now; but it will complete the clinical view of the case if I state that, while it is true that there are two great classes divided from one another by well defined marks, simple and malignant, there is a debatable ground between the two—a variety of tumours or growths which it is exceedingly difficult, if not impossible, to assign either to the one or to the other; and, in addition, the malignity of the tumour occurs in different degrees of intensity. That form of malignant disease which is called encephaloid, that called scirrhus, and that called colloid, are three varieties in which there is no doubt whatever of the intense malignity—I mean of their inherent abnormality of growth, if I may use the term, and their enormous tendency to return if removed; so much so that, in dealing with tumours of that kind, we are absolutely unable to say that we expect them not to return, though the time of their return is a matter of doubt. *But then* there is another kind of malignant tumour, which, though properly *called* cancer, is less malignant than the others, and this less malignity is

shown both clinically and microscopically. Epithelioma or epithelial cancer differs from those which I have previously mentioned in being an exaggeration of the epithelial tissue. I beg you here to remember that I am not going into the deep pathology of tumour; because, were we to go a little farther than we are doing at present, we would fall into the discussion between the epithelial and fibrous pathologists. There is one class of pathologists who hold that all tumours, especially malignant tumours, arise altogether from an abnormal change taking place in the epithelial tissues. Another set hold that all malignant tumours arise from an alteration of the fibrous structure in the particular part. Epithelial tumour resembles closely the natural epithelium, only it is more complex in its arrangement. In this way, therefore, while in internal structure, it has a certain resemblance to the true malignant tumour, it partakes, also, of the character of simple tumour clinically, because it can be removed with success.

But there is a kind of tumour which belongs to the simple or non-malignant fibrous kind, which partakes of malignancy, inasmuch as it returns after removal. Such is the tumour which used to be called recurring fibrous tumour. You will observe that I am adhering to the old nomenclature; and I do so with the view of conveying information to the comparatively junior students. When you enter the pathological class, you will find that tumours are differently classified.

Having, then, stated these elementary views as to the character of tumours, let us now say a word or two with regard to their treatment. The question I am going to discuss is not so much the possibility of treating these tumours medically in the way of palliation, but particularly with regard to surgical removal. I wish, however, to tell you at the outset, that, because a person has a well defined tumour in the mamma, it is not absolutely necessary to excise it. I shall say nothing at present with regard to removal by caustics; but it has fallen within my own experience to have seen several most remarkable examples of the disappearance, I might almost use the term cure, of tumour by pressure; and that information is, I think, of great value, because in many cases, from the constitution or the age of the patient, or from the implication of the neighbouring parts, you could not, with any degree of conscientiousness, recommend removal of the tumour; but I could show you ladies in Glasgow at the present day who have had tumours in the mammæ, and who are now absolutely free from the disease by the application of careful and well directed pressure. You are aware that pressure will cause absorption both of normal and of abnormal tissue; and you are probably aware that, if a person have an aneurism of the aorta, and if the aneurism continue to grow, it not unfrequently happens, through the tumour pressing upon the sternum, that it gradually induces absorption of the bone until it appears underneath the skin, and, if not arrested, it spontaneously bursts, and causes loss of life. We are all aware of the importance of pressure in assisting the absorption of abnormal fluids; as by the use of a splint and bandage in cases of effusion into joints. In the same way, pressure, well directed to the breast, has a remarkable effect in causing the absorption of tumours; and I now am in the habit of ordering the application of a properly prepared apparatus in cases where, either from the situation, or the implication of the neighbouring parts, I consider that the operation of excising the mamma would be unadvisable.

But, next, with regard to operation: what is the difference in the probable result or prognosis between excision of simple tumour and excision of malignant tumour? If we excise simple tumour, we remove the whole disease, and there is no more tendency to its reappearance. We can, therefore, undertake its excision, with absolute certainty of success, so far as return of the disease is concerned. We can never, however, promise to perform any operation with absolute freedom from danger, because, in certain states of the constitution, the smallest scratch may end in death. Persons frequently come to the surgeon suffering from a serious disease resulting from very simple causes. We have at present a man in the infirmary with his hand and arm inflamed to such an extent that he is likely to lose them, and all from a scratch at the point of one of his fingers. It does not matter,

then, whether the scratch is given by the surgeon or by the patient; it depends upon the state of the constitution whether or not inflammation will ensue. In the excision of simple tumour, then, all that is necessary is that the whole tumour shall be removed—you must not leave a bit of it. But you can do this with absolute certainty; because all that you have to do is to cut through the surrounding tissues, and remove it entire with its capsule. Should it chance to be irregular, and should you leave any part of it, you have simply to take the precaution of dissecting the bit that remains; and, having done this, you may give a certain opinion that there will be no return of the disease. But, with regard to malignant tumour, it is different, inasmuch as it is not isolated or incapsulated, but is of the nature of invading the neighbouring tissues. It is a difficult point to decide how far it extends in the neighbouring tissues; but, taking it for granted that what appears to you to be the limit of the tumour is not the limit, the golden rule is to make your incision clear of the tumour, to cut well beyond it into the sound tissue.

In excising a tumour from the mamma, do not, if possible, leave a single gland-cell—take the whole mamma away. In certain instances, especially in cases of epithelioma, such as may be situated on the back of the hand, on the sole of the foot, or on any part of the limbs, upon the edge of the lip, upon the face, or upon the extremity of the penis, where epithelial tumours are found, in such situations you can with safety cut away a large portion of the sound tissue beyond the disease; and in these circumstances, you may with certainty predict that the cure will be complete. But, in regard to other tumours not epithelial, there is this one other thing to be said: that while you can remove a tumour and its surroundings perfectly accurately, the constitutional tendency that has been the cause of the malignancy—of which I have said nothing at present—that tendency still remains; and you can only hope that it will not show itself, and return in some other part of the body. In the case of malignant tumours, all the other parts in the neighbourhood of the mamma are apt to become secondarily implicated.

Most of you are aware, of course, of the absorbents of the mamma. And here I would say to the students who are not yet out of their anatomical studies, that the study of the absorbents in certain regions of the body is very important—as, for instance, the groin, axilla, &c. Now, it not unfrequently happens that a tumour in the mamma irritates the absorbents, that irritation is communicated to the absorbent glands, and they become enlarged. Besides, while the absorbents are naturally adapted for the purpose of carrying away the fluids of the body which are to be used again, in the case of the diseased tissues they take up the diseased substance, and carry it backward to the lymphatic glands, for the purpose of undergoing elaboration. In this way, there is a danger of the lymphatic glands becoming infiltrated with the cancerous matter. It is not because of the proximity, but because of the course of the absorbents from the mamma through the axilla, that the removal of the mammary gland will not cure or destroy the disease; it will be left in the absorbents. Hence, with regard to the return of the disease, it is of absolute importance, so far as the prognosis is concerned, that you should know whether the axillary glands are implicated or not. If they be, you may be certain that the day is not far distant after the operation—it may be weeks, months, or years—but the day will come when the disease will show itself in the axilla or neighbourhood. You may relieve the patient for a long time; but I believe, if the absorbent glands be in any degree affected, it is a question of time.

Such being a general view of the nature of an operation and its results, let us come back to our case. Here is a woman with a tumour of the mamma that presents many of the appearances of scirrhus, yet some of the symptoms are absent. There is, first, the absence of pain. You will find in most of the treatises on the subject that pain is considered diagnostic of scirrhus—shooting pain, tearing across the chest, very frequently shooting down the arm and giving rise to want of rest. When that is present, it is almost always a diagnostic sign of scirrhus. But its absence is not a proof that it is not *scirrhus*; for here is a patient who has a tumour as manifestly scirrhus as it *can possibly* be, as you shall see next Wednesday when we cut it out. Sec-

ondly, there is often implication of the neighbouring glands, and that is absent in this case. And there is another point in which this tumour differs from most mammary scirrhous tumours, namely absence of retraction of the nipple. This, which is commonly regarded as one of the symptoms of scirrhus, is simply a mechanical result. In scirrhus of the mamma, the whole substance involved is converted into a firm, hard, rigid structure. The progress of scirrhus is to extend, to draw together what is a soft, irregular, moist substance into a hard, rigid substance, the section of which, in a freshly excised tumour, has very much the appearance of a frosted turnip. The skin of the mamma is more or less movable on it; but the nipple is joined to the gland by ducts and fibrous structures, and consequently, when contraction of the scirrhus takes place, it may recede a little from the skin, and yet the skin does not follow it till adhesion actually takes place: but the nipple being attached to the gland in which the malignant substance is infiltrated retraction is simply a mechanical result. In this case the nipple is partially retracted, but not to such a degree as would indicate scirrhus if there were no other symptoms.

What, then, is the characteristic mark which enables me to say that it is scirrhus? The name indicates. Scirrhus is a substance hard, unyielding, slightly nodular. When these symptoms are present, there is almost no other tumour of the mamma that it can be.

If this, then, be a case of malignant tumour, of undoubted scirrhus, and if it be true that scirrhus, after being removed, has a great tendency to return, either in the former seat of the disease or neighbouring parts, why do we perform the operation? That is one of the most difficult points for the surgeon to make up his mind upon, and it is a very poor subterfuge for him to tell the patient the *pros and cons*, and leave her to decide. In the present instance, the patient is so absolutely unable to come to anything like a correct judgment, that the surgeon should be definite in his opinion. There are a great number of operations in which the patients can assist the surgeon; in which they can make up their minds for themselves. In cases where it is not a fatal malady, in cases where it is a mere deformity of appearance, in these and numerous similar cases, the patient can be taken into the surgeon's confidence. But I do not think it is possible for any patient or friend of a patient in a case such as the present to put himself into the position of having proper information with regard to it, and it is, therefore, for the surgeon to make up his mind. In not a few cases of patients who have been brought before me in private for consultation, I have said, "No; I shall not operate." In a notable example, I have said, "This operation ought to be done;" but it is very difficult to convey to you the reasons that should induce the surgeon to operate, or refuse to do so.

But let us take the present case as an example. What are the circumstances which should induce me to perform an operation upon this patient? First, as regards the tumour; and, second, as regards the woman.

As regards the tumour, it is perfectly movable upon the subjacent parts; it is quite clearly non-adherent upon these parts; secondly, the skin upon the circumference of the tumour is absolutely healthy; thirdly, the axilla is perfectly unimplicated. These are the three points with regard to the tumour which make it certain that, if operation be properly performed, the tumour and its connections can be removed without leaving a trace of the disease behind it. Now, scirrhus is one of those forms of disease so connected with the constitution, that it is not at all unlikely that, at no distant day perhaps, the disease may reappear in the other mamma, in the axillary gland, or in some other part of your body; but, even supposing I were perfectly certain that within a year the disease were again to show itself, should I not take that into account?

Let us next, therefore, consider the woman. And I think it is a very important thing for students to get into the habit of considering their patients. I am afraid that the tendency both of the surgeon and the students of surgery is to look at the physical condition of the part, forgetting a little the circumstances of the patient. I hope that is not the case with you; but it is important that it should every now and then be brought before you. Here is

a woman who has comparatively suddenly become aware that she has cancer in the breast. I did not need to tell her that; she knew well enough, and that was why she came to me. She said, "I have got cancer in the breast." As you saw, she is of a nervous temperament, and she has a very disagreeable and painful feeling with regard to this scirrhus in the mamma. She has the horror of cancer upon her. Unlike many other diseases, cancer creates in the patient who is conscious that he or she has it a feeling of great depression. This patient wonders what will happen. We do not tell her what will happen, but we all know very well. A growth discovered three months ago suddenly puts on activity, which causes it to increase in size very much more than before. Within that time, probably, adhesion to the skin near the nipple has taken place, and that is the only part that is adherent. What will be the history of the case if I do not touch it? The adhesion to the skin will increase; a little red spot will show itself where the adhesion to the skin exists; within a short time, ulceration will take place, creating a loathsome discharge; the life of the patient will extend to two or three months, during which her whole existence till death relieves her will be most painful. That would probably be the history of the case. Well, if we be able to perform the operation in such a way as to enable her to recover from its effects, and if we be able to eradicate the disease, temporarily even, we will then have it in our power to say to the woman, You are free from cancer; your tumour is away; your disease is removed; it is in the hands of Providence when it may return; in the meantime you are a healthy woman. Is it not worth while undergoing an operation which is rarely fatal, rarely dangerous, for the sake of being free from the condition I have described, restored for weeks, months, perhaps years, to a state of perfect health? I maintain that excision of the mamma ought to be performed; and for these reasons, which you may extend to others, I intend to operate upon that woman. I hope and believe the operation will be successful, and, when the wound is cicatrised, she will leave the hospital perfectly healthy for the time being. To show that this is no chimerical notion, I ask you to remember the operation you saw performed the first operation-day in this hospital, where you saw removed from a woman a large tumour somewhat of the same kind. She is not here now, because, two days ago, I gave her an admission here to the Convalescent Home at Dunoon, where she is at present enjoying herself; whereas, if the operation had not been performed, she would have been lying in bed, suffering from a loathsome discharge from a disease which would result in her death in a very short time; and I think that is a great deal gained.—*British Medical Journal, Feb.* 26, 1876, *p.* 247.

ADDENDA.

99.—AN OFFICINAL MULTIPLE ANTIDOTE.

(From Dr. RICHARDSON's Report on Toxicology in the Medico-Chirurgical Review.)

Dr. DU VIVIER proposes an officinal multiple antidote for poisons. His proposition, which was read by Dr. Jeannel before the Medico-legal Society of France, on the 8th of Feb., 1875, supplies the following as the formula of his antidote :—

Solution of sulphate of iron (sp. gr. 1·45)	100 parts.
Water	800 "
Calcined magnesia	88 "
Purified animal charcoal	40 "

The iron solution is to be kept separately; the magnesia and animal charcoal in a bottle with water. When required for use the iron solution should be poured into the bottle, and the whole shaken well together.

1. This mixture should be administered in consecutive doses of from 50 to 100 grammes.

2. The experience of the author has proved that this antidote renders preparations of arsenic, of zinc, and of digitalis, completely insoluble; that it does not render oxide of copper entirely insoluble; that it leaves in solution a notable quantity of oxide of mercury, and an appreciable quantity of morphine and of strychnine; that it does not decompose nor precipitate the cyanide of mercury; that it thoroughly saturates free iodine; that it acts partially only on solutions of alkaline hypochlorite.

3. The author's experiments upon living animals justify him in arriving at the following conclusions :—That the proposed antidote is perfectly efficacious in the case of arsenical preparations in the proportion of 120 grammes of antidote to five decigrammes of arseniate of soda. It retards the poisonous effects of the sulphate of strychnia, and would perhaps give time for the administration of salutary evacuants. It has been seen to act efficaciously against digitalis injected into the intestines in doses of one decigramme.

4. This formula is certainly preferable to the officinal hydrate peroxide of iron, as this undergoes by the action of time and of a temperature higher than 15° C., a molecular modification, which renders it inefficacious against arsenical preparations. This formula, containing peroxide of iron, extemporarily prepared, of magnesia hydrate and of animal carbon, is a satisfactory antidote in a great number of demonstrations. It is, however, not efficacious against alkaline minerals, phosphorus, the hyperchlorites, the cyanides, and tartar emetic.

5. The protosulphate of iron, dissolved and mixed with magnesia and sulphate of soda, is of absolute chemical efficacy as regards the salts of copper. As regards bichloride and cyanide of mercury it seems preferable to the extemporised hydrated peroxide of iron; but it is inefficacious against arsenical preparations, the sulphate of strychnia, and possibly the other alkaloidal salts.—*British and Foreign Med.-Chir. Review*, Jan. 1876, p. 234.

100.—SUCCESSFUL EMPLOYMENT OF PHOSPHIDE OF ZINC IN A CASE OF MERCURIAL TREMOR, AND IN ONE OF CHRONIC ARSENICAL INTOXICATION.

By Dr. Noel Guenbau De Mussy, Physician to the Hôtel Dieu, Paris.

Phosphorus has taken, during the last few years, a most important place in therapeutics, both as modifying the nervous system and improving its impaired nutrition.

About eight or ten years ago, M. Vigier, a very learned chemist of Paris, pointed out the advantages of phosphide of zinc. This preparation is much more stable, more definite, and more easily handled than phosphoric oil, which is commonly employed. Whilst the phosphoric oil is very easily altered by oxidation, and untrustworthy in its effects, no variation of power, no change of composition takes place in the phosphide of zinc.

Four milligrammes of this substance contain one milligramme of phosphorus, but in reality, according to the researches of M. Vigier, the physiological action is equivalent to only half a milligramme. I always prescribe two pills of four milligrammes each to begin with, and proceed gradually to six pills when the physiological effects, which must be carefully observed, do not seem to be sufficiently marked. If any signs of intolerance appear, I suspend the course for some days, to begin again afterwards in the same way. Generally, after twelve or fifteen days, I allow the patient to take rest, and discontinue the medicine during four or five days.

About ten years ago I had occasion to relate in the Gazette Médicale, and later on in my clinical lectures, the successful employment which I made of this substance in cases of tremor. A very striking case of this description has recently presented itself to me.

For more than six weeks the patient had been affected with a violent quivering of the limbs, which made him quite an invalid. He could not help himself in any way; and even when his arms were resting, lying on the bed, the trembling did not subside. He also complained of pains in his back, and his face was red and flushed. The gums were red, swollen, and bordered with a purple rim. Fearing, from the spinal pains, that the specific poisoning of the nervous system was attended with a congestive process, I did not venture to give phosphide of zinc immediately, but prescribed a purgative, and applied two small cauteries to the base of the neck. After some days, the pain being relieved and the symptoms of irritation somewhat abated, I prescribed two pills of the phosphide of four milligrammes each. After two days of this treatment, such was the improvement in the patient's health that he could walk alone and eat without being helped; and a few days later he found himself so well, though he was not completely rid of a slight trembling, that he insisted on leaving the hospital.

Another case lately occurred in my wards which gave me an opportunity of testing the modifying action produced on the nervous system by phosphide of zinc. A man of fifty years of age came into my wards complaining of pain and weakness in the back and limbs. He had not been able to walk or stand for one month. The left leg was much weaker than the right. This weakness extended to both arms, but was much more marked in the left one which could not retain hold of anything, and presented signs of paralysis of the extensor muscles, and especially of the last three fingers. Sight and hearing were also much impaired on the left side. Tactile sensibility of the skin, investigated by means of the æsthesiometer, was rather dull, though very slightly so. No alteration was noticed in the perception of heat, or weight, or pain. The vaso-motor action seemed impaired in the integuments of the hands, which were stained of a reddish-blue colour. Pressure on the larger nervous branches, and especially along the vertebral grooves, excited such pain that the patient would start and scream. He had been employed in a manufacture of aniline-red, and had thus been exposed to arsenical vapours. This circumstance, and the recollection of a pamphlet *lately* published by Dr. Scolosuboff, of Moscow, led me to suspect that the nervous disorders observed in this case might depend on poisoning of the

system with arsenic; and, indeed, the analysis of the patient's urine showed the existence of a large quantity of this substance, and thus confirmed my suspicions. I first ordered some baths and the internal use of a mixture of sulphur and honey, in order to eliminate the remains of the poison deposited on the integuments; I then prescribed the phosphorated pills, and after three or four days I noticed a great improvement in the condition of the patient. He could walk and make use of his hands, the pains were abated, and the general appearance was much more satisfactory. After a fortnight he could distinguish with his left eye small printed characters, whilst he was unable before to make out even the largest type; he was also able to discern colours which hitherto had appeared quite confused to him. The patient is still under my care, and feels every day better, though the strength of the left limbs and of the extensor muscles is not yet quite restored.

In the above case some points deserve to be especially noticed. Paralysis, though general, was more marked on one side, constituting real hemiplegia, and extending to the organs of sense. The very interesting researches made by Dr. Scolosuboff, with the result of showing that the poison mostly accumulates in the nervous centres, can explain the fact, whilst the rapidity of the patient's recovery indicates that, notwithstanding the gravity of the symptoms, no deep lesion of the organic structures had taken place.—*Lancet*, *Feb.* 5, 1876, *p.* 208.

101.—ON THE ADMINISTRATION OF ALCOHOL IN THE TREATMENT OF DISEASE.

By Dr. Benjamin W. Richardson, F.R.S., &c.

In the earliest part of my professional career—twenty-five to thirty years ago,—the lessons taught in the English and Scottish schools were very simple and, admitting the premises on which they were based, sound. They were the continuation of a wave of the Brunonian theory, though the name of the theory and much of its curious history had become entirely forgotten. The value of alcohol was thought to lie in its power of sustaining the animal body during "asthenic" states, and of saving the body from exhaustion of its "excitability." Alcohol, therefore, was administered, with moderate freedom, in cases of general dyspeptic debility; of hemorrhages; of fever when the pulse was failing in power; of syncope; of shock; of exhaustion from a discharge from the body, as from an abscess, or from free secretion of milk in the woman; of depression from severe inflammatory states, as in carbuncle or erysipelas; of melancholic, depressed, and nervous states of mind; of phthisis pulmonalis; of hysteria; of delirium tremens; of paralysis. It was administered in all cases in which it was considered that the patient would be likely to sink or in which the patient was thought to be actually sinking into death. The universality of the remedy, as an aid to substances more purely medicinal, was, in fact, admitted by nearly every practitioner.

A little later, the employment of alcohol in medicine became, I will not say more systematic, but more extended. The teachings of Dr. Todd led many practitioners to "rely," as they expressed it, on alcohol, to the exclusion, in some instances, of all other active treatment. For my part, I was never drawn into the practice of this extreme school; but for more than twenty years I held by those lessons which I originally learned from my first masters.

Within the past six or seven years a change has come over the medical world in respect to the value of alcohol as a remedy. This change is due to the new light that has been thrown upon the subject of the physiological action of alcohol. I do not now enter on the physiological question. It is sufficient for me to say that, without any kind of prejudice against alcohol as a remedy, with indeed some prejudice in its favour, I have felt it a duty to study its medicinal action in a more critical spirit than I did originally, and that the result is a correction of many errors of grave import.

Thus I have learned a series of new truths and practices in the treatment of disease which I would submit as being worthy the consideration of those who have not yet arrived at the same conclusions.

To some of the changes of practice I have been led solely by physiological guidance; to some by the process of following and testing the practice of other physicians who have ventured to move in steady advance in the path of clinical research.

Of the new facts which I have, so far, learned from new observation, the following are the most important.

I. There are cases, commonly called cases of debility, in which there is no objective sign of organic disease. The leading symptoms are those of persistent dyspepsia; flatulency; irregular action of the bowels; hemorrhoids; much exhaustion under moderate physical exertion, and great mental depression under slight mental disturbances; extreme nervous excitability, amounting to hysterical excitement; a condition of urine variable in character, the fluid sometimes of straw colour and abundant, at other times scanty and loaded with lithates; the sleep disturbed, with frequent movements and muscular starts of the lower limbs at the moment of going to sleep; a deficient appetite, and a white loaded tongue. In these examples—as common, by the way, to-day as in former times—the old practice used to consist in trying "to regulate" the wine or other alcoholic beverage. My experience now is that these symptoms are in nearly every instance caused by alcohol, and that the only certain successful treatment is total abstinence. To the practical conclusion here stated I have been led by the study of the action of alcohol upon the healthy body. The phenomena described are the symptoms of alcohol when it is taken in what is commonly presumed to be a moderate, and, as it has seemed to many, a necessary quantity. These phenomena and their cause have been very carefully and ably described by Dr. Marcet.

II. That alcoholic stimulation was the first point of practice in the treatment of acute hemorrhage was a lesson of all others most impressed on my student life. For many years I held by it, as a matter of faith, so strongly, that if in a fatal case of hemorrhage I had been obliged to withhold the stimulant I should have looked back upon the proceeding with sincere regret. At the same time some striking facts were occasionally presented to me, which startled me at the time, and which would have taught to a mind less forcibly impressed with a preconceived idea a new experience. I was called at night to see a weak and emaciated woman who had been attended by a midwife, and who had been flooding for several hours, owing to retained adherent placenta. The woman was semi-conscious, occasionally feebly convulsed, and cold, from the loss of blood. If wine, sherry or port, had been at hand, I should have given her half a bottle at least, or any other form of alcohol in like proportion; but there was not a drop of alcoholic drink in the house, and the house was some miles from a village, so I was obliged to get on without the stimulant. I extracted the placenta, kept up firm pressure on the uterus with the hand, and administered freely the only sustenance that could be had—viz., milk diluted with water and sweetened with sugar. The hemorrhage stayed, the patient fell into a sleep, and I left her in the early morning comparatively safe. At a visit later in the day she was in a condition as favourable as I had ever seen for recovery under like circumstances, and she actually recovered as quickly as could be imagined possible, without taking a single dose of alcohol. This recovery was backed by many others; by the recoveries from exhaustion after venesection without administration of alcohol; by the recoveries of the inferior animals from hemorrhages carried up even to apparent death. They did not teach me anything more than a list of curious exceptions from an imaginary rule.

Meanwhile it was impossible to be blind to another set of facts—namely, that the alcoholic remedy for hemorrhage, potent as it might be, was not without its disadvantages. It caused generally a reaction more or less troublesome; and sometimes, during the reaction, hemorrhage recurred. It caused often an extreme, restless nervousness of the patient. It deranged the secretions. It lessened the appetite for sustaining foods, and it led thereupon to an exhaustive feverish condition,—famine fever,—which was not

satisfactory. Lastly, it was by no means so invariably successful a remedy as might be desired and expected. These drawbacks, however, pertain to many remedies; indeed, not one remedy is certain, not one perfect. Alcohol therefore, like the rest, must be accepted with all its imperfections on its head.

III. There is a class of cases of the hemorrhagic kind in which the administration of alcohol is, according to my experience, indifferent practice. I refer to cases of recurrent hemorrhage, cases typically seen in simple recurrent menorrhagia in women. The patient under these circumstances, greatly reduced in power, is easily misled by her own sensations to think well of alcohol. She is mentally and physically feeble. She takes, in periods of lowness, a glass or two of wine or a large draught of stout, and for a time she feels so much relieved by the assumed remedy that she resorts to it again and again, as if it were her only support. There comes a stage at last when this belief is so firmly accepted that nothing, however reasonably or cogently said, can remove it.

The results of the treatment are, at the best, dangerous; at the worst, disastrous. There is engendered a dislike for natural good food, a depraved appetite, and a persistent dyspepsia. The bowels are rendered irregular—at one time sluggish, then relaxed; and the stomach and intestines are frequently distended with flatus. The action of the heart is feeble and irritable. The mind is depressed, and the emotions are either excited into hysterical elation or lowered into despondency. With these symptoms there is the continuance of the hemorrhage, for a time passively, at periods actively and copious. We administer steel, or steel and quinine; we administer mineral acids; we administer gallic acid, or other styptic remedies. We employ astringent injections or other local methods for arresting the loss of blood. All our remedies, useful though they may be, are imperfect, and are slow in their operation, even when they are curative in their ultimate effect.

My experience of this class of cases now is that the first point of practice in their treatment consists in withdrawing the alcohol. As soon as the unrest which alcohol induces is set up, the vascular depression at one moment, the quick excitement at another, is allayed, and the cure commences. Peace is secured. The current of the blood flows on in steady stream; the blood regains its plasticity; the weakened vessels have rest; the nutritive changes are more naturally carried out; the nervous system is toned to even tension; and the signs of amendment begin to appear. Then our remedies seem to be endowed with virtues, and recovery is the natural consequence. I exclude of course from these examples of chronic hemorrhage all in which the blood is derived from a malignant source. In these the rule of abstinence from stimulant is good also, but the benefit of it is not to be accepted, as in the other instances, for a method of cure.

Patients suffering from chronic loss of blood, and who are in the habit of taking alcohol to meet the sensation of exhaustion to which they are constantly subjected, are often very difficult of treatment. They hold by the assumed remedy hard and fast, so that it is necessary to be most firm in relieving them from its bad influence. As a general fact, I find that no half measure, no temporising measure, is of avail. If one glass of wine be permitted occasionally, two will be taken, and that means a continuance of the vicious system.

The argument used by the patient against the withdrawal in these cases is special. It is that some kind of undefined but terrible danger must or will occur, if all the so-called alcoholic support is withdrawn. The only danger I know of, and that is real, is to the practitioner, who runs a risk of losing the confidence of his patient if he too determinedly maintains his position. The people generally, even the best educated of them, do not understand this question as we medical men do, and so they persist in defending an engrafted belief which an acquired appetite often sharpens to a very fine edge indeed, with an obstinacy, and, I might say, a skilfulness of argument which is truly perplexing.

The best means of securing confidence is to learn it first; to make sure by

observation that the treatment suggested is safe, and having gained this knowledge with certainty, to impart it without a shade of doubt.

It is, of course, a matter of great practical moment to be sure that it is safe to withdraw from a patient that which for a period, and for long periods, seems to confer signal benefit; and for my part, if I had hesitation on the subject, I would express the same. But, so far, I have not the slightest evidence before me of any harm whatever accruing from the entire and sudden withdrawal of alcohol in the class of cases under consideration. On the contrary, when the appetite for the stimulant is appeased, and the mental worry and fear which attend the withdrawal are calmed, I have never seen anything but good as the result of the practice. My experience further is that the lower a patient feels, the greater is the reason, as a general rule, for enforcing total abstinence. The chances are large, that the lowness which the alcohol relieves will be intensified when the effect of the brief stimulation it has produced has passed off.

I have brought forward as types of the chronic hemorrhagic cases those of menorrhagia, first, because they are most common. I include, however, under the same class, others where blood is recurrently lost. Cases of loss of blood from piles are treated with much greater success, and with much more certainty of cure, when total abstinence from all alcoholic drink is enforced. The effect of alcohol is so decidedly to induce congestion of the liver, and venous congestion of the hemorrhoidal veins is so ready a consequence, that many persons I have known who have been subject to bleeding from hemorrhoids have suffered proportionately to the degree of their indulgence. All have been benefited by abstinence.

In the treatment of hemoptysis it has been my practice at every stage of my medical career to enforce abstinence from alcohol as a part of the treatment. This practice I gleaned from an early lesson, and I have never seen any result from it except the best. It is indeed singular to observe that in the treatment of this form of hemorrhage the administration of alcohol is, with an all but common consent, forbidden by practitioners of medicine. In the many cases of hemoptysis I have seen and in the varieties of practice I have witnessed, I cannot recall an instance in which alcohol has been prescribed or recommended in any form as a remedy. I think I may say I do not remember a case in which it has been systematically permitted. That this practice of withdrawing stimulants in hemoptysis prevails so generally is not wonderful. It is begotten of the fear of exciting a recurrence of the hemorrhage by stimulating the heart. It is sustained by the manifest wisdom of the practice, by the observation, so widely confirmed, that in the worst stages of pulmonary disease the hemorrhage ceases under the abstinence, and is in the rarest of instances the cause of death. Nevertheless, it is wonderful that this disease hemoptysis should have been made so remarkable an exception in respect to treatment, and that the success of treating it without stimulation, even when the powers of life are at their lowest ebb, should not have suggested the applicability and soundness of the same treatment in all other hemorrhages, acute and chronic.— *Lancet, Jan.* 1 *and* 22, 1876, *pp.* 6, 122.

102.—THE PHYSIOLOGICAL ACTION OF ALCOHOL.

By Dr. T. Lauder Brunton, F.R.S., Assistant Physician to St. Bartholomew's Hospital, London.

It is only with the action of alcohol more or less diluted on the blood and vessels with which we have to do. It acts on the white blood corpuscles by first increasing and then diminishing their amœboid movements. What the effect of such increased movements of the corpuscles will be upon the body as a whole it is difficult to say, but the result of its action on the red corpuscles is more easy to trace. George Harley and Schmiedeberg have found *that it* lessens their power of giving off oxygen, and must consequently more *or less* diminish the oxidation of the tissues. Now, both the functional

activity of organs and the production of heat in the body depend on the processes of oxidation within them, and it is obvious that any interference with these processes is not likely to be beneficial so long as they are going on in a healthy way, and not too rapidly. As we shall afterwards see, however, this effect is to some extent counteracted, or even more than counteracted, by the action of alcohol in accelerating the circulation, and if the quantity taken be small, and not frequently repeated, little or no harm will ensue. If it be frequently taken, however, by persons in average health, and with fair digestion, its effects will become manifest in the imperfect combustion of fat, and its consequent accumulation in the tissues. This seems to occur especially in the skin, which acquires a velvety feeling. From this quality of the skin I have seen Professor Neumann, of Vienna, diagnose the potatory habits of a man whom one would otherwise never have suspected. If much saccharine or other fat-forming matters be taken at the same time with frequent doses of alcohol the subcutaneous tissue also becomes loaded with fat, as we so frequently see in brewers' draymen, and if the consumption of alcohol be excessive it causes fatty degeneration of various organs. This power of alcohol to lessen oxidation, useless or even injurious in health, increases the value which its other properties give it in the treatment of febrile diseases, where oxidation is going on too quickly, and rapidly destroying the tissues. The very increase of temperature which this oxidation causes helps of itself to accelerate this disintegration of the tissues, for a high temperature causes them to split up, even although they do not undergo oxidation. Thus the albuminous tissues probably become decomposed and yield urea, other nitrogenous substances, and fat. The fat does not undergo complete combustion, but accumulates in the tissues from which it has been formed, and thus the heart of patients who have died of pyrexial diseases, instead of being purely muscular, is generally to a great extent fatty.

In such a condition of pyrexia alcohol will diminish the excessive waste in two ways. Firstly, it will impede oxidation, and secondly, by thus lessening the temperature, it will diminish tissue-disintegration.

But while alcohol thus modifies the blood, does it undergo no change itself? Does it simply course through the vessels for some time until it can be eliminated unchanged by the various emunctories, or does it undergo combustion in the blood as the grape sugar from which it is derived would do, and thus deserve like it the title of food?

Great numbers of experiments have been made to decide this question, and diametrically opposite opinions have been founded on them. Liebig classed it as a food along with sugar and starch, and no doubt was thrown on the correctness of this classification, until Lallemand, Perrin, and Duroy published their experiments, from which they concluded that alcohol is entirely eliminated in an unchanged condition, and can therefore, in no sense, be termed a food. Their conclusions, however, were much more general than their experiments warranted, and they did not pass unchallenged. What their research actually showed was not that the whole of the alcohol injected passed out of the body, but only that a part of it is excreted. Similar experiments were made by Baudot, who instead of using large doses used small ones, and he found that instead of the whole or a great part of the alcohol being excreted, only a small fraction, so small as to amount practically to nothing, found its way out through the kidneys. The question was then taken up by the late Dr. Anstie, who did much to solve it; and had he only lived to complete the researches on which he was engaged at the time of his death would have settled it completely. His experiments, as well as those of Thudichum, Dupré and Schulinus confirm Baudot's, and show that only a trifling fraction is eliminated. A year or two ago, Subbotin published some experiments, in which he found a much larger proportion of the alcohol to be excreted than the other observers just mentioned had done, but he, as well as Lallemand, Perrin, and Duroy, used very large doses. Now we all know that grape sugar is a most valuable food—the food we may say *par excellence* of the body, for others are converted into it in the liver—and in moderate quantities it undergoes complete co[illegible] and is not eliminated *in* the urine. But a man

diabetic by giving him a large quantity of syrup at once, for the organism not being able to consume more than a limited amount at a time, the excess is thrown out by the kidneys. It is therefore not to be wondered at that alcohol should be excreted after large doses have been taken; in fact, the wonder would be if it were not.

The importance of the question whether alcohol undergoes oxidation in the body or not consists in this: if it is oxidized it will supply energy for muscular exertion, or for keeping up the animal heat, or for both, and will therefore be entitled to rank as a food, while if it is excreted unchanged it will have no claim to the name and must be classed with such substances as the organic alkaloids, which after acting on the nervous and muscular systems, while they are circulating in the blood, pass out after a while by the emunctories. It is the merit of Baudot, Anstie, and others who have worked at this subject, to have shown that alcohol is oxidized, and is thus to be reckoned as a food and not merely as a drug. But still more satisfactory evidence of its claim to the title of food is afforded by the fact that it will keep up the weight of the body and prolong life when the supply of other food is insufficient or is entirely wanting.

Dr. Hammond found that when he took an insufficient diet and was daily losing weight, the addition of alcohol not only prevented this loss of weight, but converted it into an actual gain. In his work on "Stimulants and Narcotics," Dr. Anstie has collected a number of cases in which persons have lived for a considerable time either upon it alone or along with a quantity of food so small as to have been utterly inadequate without it.

From a survey of all the evidence on this subject, I think we may conclude that in moderate doses alcohol undergoes combustion in the body, and will supply energy, yield warmth, and tend to sustain life in the same way that sugar would do, and is therefore to be reckoned as a food. At the same time it has a power of diminishing oxidation which prevents its employment as a food to any great extent in health, but greatly increases its utility in disease.

In feverish conditions it diminishes tissue waste, and thus keeps up strength in three ways:—1. It undergoes combustion itself as a food instead of the tissues. 2. It lessens oxidation in them. 3. It lowers the temperature which itself increases tissue degeneration. It may perhaps seem rather contradictory to say that it undergoes combustion and yet diminishes combustion, but in this respect we may compare it to the sulphur which some people are accustomed to throw into their grate when the chimney takes fire—the sulphur burns itself, but it puts out the blazing soot.

A moderate quantity of alcohol may enable a man to overcome a sudden difficulty, but can its effects be kept up so as to help him with a prolonged effort? Does the alcohol supply new strength, or does it merely enable a man to use up his reserve of energy? If it really supplies strength we ought to find it doing so each time it is administered; but if it merely helps to use up reserve energy, we will find that each successive time it is given the organism responds less and less readily to the call, just as a man gives more and more grudgingly at each successive demand upon his purse. Now the question was thoroughly tested during the Ashanti campaign, and the following are the results as recorded by Professor Parkes:—

"The first effect of alcohol, when given in a moderate dose (for example, what is equal to one fluid ounce of absolute alcohol), is reviving, but this effect is transient. The reviving effect goes off after at the utmost two and a half miles of additional march, and sometimes much before this; then the previous languor and sense of exhaustion not only return, but are sometimes more intense, and if alcohol is again resorted to, its effects are now less satisfactory. Its reviving power is usually not so marked, and its peculiar anæsthetic and narcotising influence can often be distinctly traced. The men feel heavy, dull, disinclined to march, and are less willing and cheerful."

From this it is evident that alcohol does not impart strength, but rather enables a man to use up in a short time the energy which he usually would have taken a much longer time to expend. If he only requires to make a single *effort* and can rest afterwards until he has replaced his exhausted store, the *additional* temporary strength obtained by using alcohol may enable him to

overcome an obstacle which would otherwise have baffled him, but if he has to make prolonged exertions alcohol is injurious.

Now the heart seems to be affected by alcohol in the same way as the body generally. No new strength is imparted to it, but it is enabled to draw on its reserve. Thus Parkes has found that when brandy is given to healthy men the pulse becomes quicker, but after the effects of the brandy have passed off it becomes slower than natural, so that the number of pulsations and amount of work done by the heart in twenty-four hours is much the same whether brandy have been taken or not, unless the doses be large and repeated.

The question therefore at once arises,—is alcohol only useful in stimulating the heart to do additional work, and thus averting the danger of failing circulation for a short time only, or can it be used in diseases where this danger is to be averted for days, and even weeks together? Before attempting to answer this question, I would remind you that a heart which is beating more quickly than usual, wears itself sooner out than one which is acting slowly. It has been found that a heart which has been made to pulsate slowly for some time by irritation of the vagus, will continue to beat for a good while after it has been removed from an animal's body; while, on the contrary, it very soon ceases to beat if the vagi, instead of being irritated, have been cut, so as to allow the pulsations to be very rapid for some little time before the animal's death. What is observed in these excised hearts is only an exaggerated representation of what occurs in the body, and although in it the pulsations may continue days instead of minutes, yet the final result will be similar. If alcohol always quickened the pulse in disease as it generally does in health it would probably be injurious in prolonged illness, as it was found to be in prolonged exertions by the soldiers in Ashanti. But this is not the case, for in fever the quick pulse frequently becomes slower after the administration of alcohol, and, indeed, an excellent rule of practice is not to give alcohol if it increases the rapidity of the pulse already too quick. Alcohol thus economises the vital power of the heart, and tends to prevent death from exhaustion. It is difficult to say precisely how the slowing of the pulse is effected.

The chief points in this paper are:—

1. Alcohol, in small quantities, increases the secretion of gastric juice and the movements of the stomach, and thus aids digestion. Although unnecessary in health, it is useful in exhaustion and debility.

2. It increases the force and frequency of the pulse, by acting reflexly through the nerves of the stomach.

3. In large doses it impairs digestion by over-irritating the stomach.

4. It may produce death reflexly by shock.

5. After absorption into the blood, it lessens the oxidising power of the red blood corpuscles. This property renders it useful in reducing temperature; when constantly or very frequently present in the blood, it causes accumulation of fat, and fatty degeneration of organs.

6. It undergoes combustion in the body, maintains or increases the body weight, and prolongs life on an insufficient diet. It is therefore entitled to be reckoned as a food.

7. If large doses are taken, part of it is excreted unchanged.

8. It dilates the blood-vessels, increases the force and frequency of the heart by its action on the nervous centres to which it is conveyed by the blood, imparts a feeling of comfort, and facilitates bodily and mental labour. It does not give additional strength, but merely enables a man to draw upon his reserve energy. It may thus give assistance in a single effort, but not in prolonged exertions.

9. The same is the case with the heart; but in disease alcohol frequently slows instead of quickening the pulsations of this organ, and thus economises instead of expending its reserve energy.

10. By dilating the vessels of the skin, alcohol warms the surface at the expense of the internal organs. It is thus injurious when taken during exposure to cold, but beneficial when taken after the exposure is over, as it tends to prevent congestion of internal organs.

11. The symptoms of intoxication are due to paralysis of the nervous system; the cerebrum and cerebellum being first affected, then the cord, and lastly the medulla oblongata. It is through paralysis of the medulla that alcohol usually causes death.

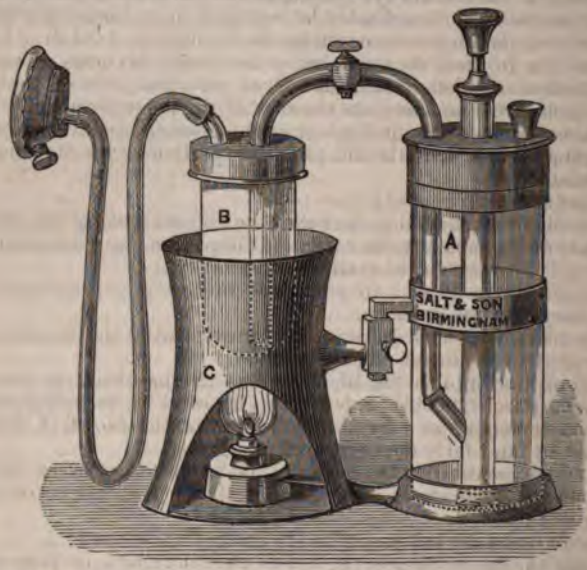
12. The apparent immunity which drunken men enjoy from the usual effects of serious accidents is due to paralysis of the nervous mechanism, through which shock would be produced in a sober condition.—*Practitioner, Feb.* 1876, *p.* 121.

103.—NEW METHOD OF ADMINISTERING ETHER VAPOUR.

By Lawson Tait, Esq., Surgeon to the Birmingham Hospital for Women.

I do not think that any other conclusion can now be drawn from the evidence before us, than that chloroform must be discarded for everything but operations on young children and pregnant women, in both of whom it acts better than any other anæsthetic, and with whom it seems to be wholly devoid of risk. With the single exception of the occurrence of pulmonary inflammation, ether seems free from danger, and therefore its use ought to become general.

Having twice experienced the danger from bronchitis, I tried various plans for removing what I believed to be its cause, and that which I have found to



be the best, is to give the vapour of boiling anhydrous ether, pure and free from any admixture of air.

The woodcut will explain the apparatus which I have devised for the purpose, and which is made by Messrs. Salt & Son, of Birmingham. Anhydrous ether (·720) is placed in the reservoir A, which will hold about ten ounces, and which is furnished with a spring pump, which drives over about a dram of ether at each stroke into the glass boiler B. This boiler is suspended in a hot-water tank C, beneath which is a spirit-lamp. From the boiler an exit tube, four or five feet long, passes to a Junker's mouth-piece.

When the apparatus is to be used, the tank is filled with water, the spirit-lamp is lighted, and about three drams of ether is pumped into the boiler. *Care* must be taken that there is no leakage from the boiler, otherwise there

will be an explosion. It will soon be found that the boiling ether gives over a large volume of vapour at a constant temperature of a few degrees below the boiling point of the sample, which of course will vary very much, but will generally be found to be pretty nearly the temperature of expired air, 31°—38° Cels. When given at this temperature, and free from air, the vapour is quite pleasant, and its taste, or rather its comparative freedom from taste, reminded me, when I tried it on myself, greatly of the flavour of nitrous oxide. It is, of course, certain that its administration will involve no risk of bronchitis. A few days ago I had to remove the breast of an old lady who had suffered for years from bronchitis and dilated heart. My friend Mr. Priestley Smith gave the ether for me by means of my new inhaler, and we were all charmed by the ease with which the patient passed over into profound coma, and the comparatively small quantity of ether which was needed—about five ounces; and I am pleased to say she has perfectly escaped the complication which I most dreaded — suffocative catarrh. Although the weather had been horribly foggy and cold ever since the operation, she has not had any cough at all, and has been able to lie flat down in bed. From my previous experience, I could not have been induced to allow this patient to incur the risks of the administration of ether in the ordinary way—I should have preferred to use chloroform.

The advance which we have made in our knowledge of anæsthetics since 1849, is in no way commensurate with the enormous amount of labour which has been devoted to the subject. We have, it seems to me, made no advance on ether for surgical work, and Simpson's establishment of chloroform for the alleviation of the pangs of labour stands just where he left it.

I think the method I have detailed will be found to be a substantial advance in the method of ether administration; and if care be taken to keep the boiler vapour-tight, and the mouth-piece three or four feet away from the spirit flame, I think the apparatus will be found quite safe. Dr. Lauder Brunton made to me the ingenious suggestion of having a steam-jacket round the boiler, but that I have not found to be practicable without greatly complicating the apparatus. The use of a hot iron bolt to boil the water, instead of the lamp, would probably be safer, but it would not be so handy, and would involve great wear and tear.

I am indebted to Messrs. Salt for the pains they have taken to carry out my plans.—*Practitioner*, *March* 1876, *p.* 207.

104.—NOTE ON AN ETHER INHALER.

By Dr. MARTIN OXLEY, Physician to the Liverpool Infirmary for Children.

When in New York this autumn, Dr. Emmett, surgeon to the State of New York Woman's Hospital, showed me an ether inhaler which is the invention of Dr. Allis. It seemed to me at first sight to be the best contrivance for the administration of ether that I had seen, and on trial I have found it quite as perfect as I expected. Its advantages are these:—The ether being very thoroughly mixed with air, the patient does not suffer from the suffocation usually felt at first inhaling; there is a large evaporating surface. A very much smaller quantity of ether is used, and less escapes into the room than with the usual mode of giving this anæsthetic; the ether can be dropped from a bottle on the distal end of the inhaler without removing it from the face; the mask is soft and pliable, fitting accurately to the nose and mouth; and, lastly, it is of very simple construction and cannot get out of order.

I have given the inhaler a very fair trial, and can confidently recommend it. Mr. Wood, of 81, Church-street, Liverpool, has made a few from the pattern of the one I bought in New York, and has had the framework electro-plated. The inhaler consists of two stout oval frames which are joined

together by wire bars three inches long and about one-eighth of an inch apart, making a sort of small birdcage open above and below; through these bars a bandage is threaded, so as to fill up the inside of the cage, the edges of the bandage presenting at its open ends; over this frame is drawn a piece of stout sheet india-rubber, which has been stitched together at the edges, so as to make a covering for the frame, projecting over one end two inches, to form the mask, and at the other one inch. The ether is poured on the bandage, which forms a close, well-made artificial sponge.— *Lancet, Dec.* 18, 1875, *p.* 874.

105.—ON THE ADVANTAGES OF ETHER OVER CHLOROFORM.

By Dr. JAMES SAWYER, Physician to the Queen's and Children's Hospitals, Birmingham.

[The writer states that until a year ago he always employed chloroform, but during the last twelve months he has always given ether, and that in a considerable number of cases.]

We must answer two questions before we give up chloroform for ether. Can we produce as perfect anæsthesia by means of ether as by chloroform? Is ether safer than chloroform? I believe both these questions may be confidently answered in the affirmative.

No one who has given ether a fair trial, even in one case, can doubt or disparage the perfectness of etherial anæsthesia. I have employed ether very frequently in private and in hospital practice. I have given it for the severest and for the most protracted operations: for ligature of the common carotid artery, ovariotomy, amputation at the hip-joint; and, in eye surgery, for squint and for enucleation of the globe; for excision of the breast, the gouging out of diseased bone, the removal of piles, &c.

But is ether safer than chloroform? This is the most important question. No complete anæsthetic is perfectly safe. We cannot fairly attribute all deaths which have occurred during artificial anæsthesia to the anæsthetic agent in employment at the moment. I wish to make the fullest allowance for all deaths from other causes. I will remind you that the first patient to whom Dr. Simpson intended to give chloroform was a boy who was about to undergo lithotomy. When all was ready, the boy unexpectedly died. No chloroform had been given. Had a few whiffs been taken, death might have been attributed to the anæsthetic. A surgeon, about to perform lithotomy, marked out a line on the patient's skin with his finger, and the man fell dead. Other similar instances might be quoted. But I have seen a hale and hearty labourer, free alike from all emotional excitement and organic disease, laid with a crushed foot upon the operating-table; chloroform was given; and before the operation was commenced, without any previous embarrassment of the respiration, the man suddenly died: died because the heart was stopped by chloroform. Of this event I was only a spectator. I believe the man died because the chloroform was given without due dilution with air. In its depressing action upon the heart lies the greatest danger from chloroform. Any one who has given chloroform largely, and with attention to the evidences of its action, knows that it usually diminishes the force of the pulse. In a few cases, however, in which the pulse is small and weak before the operation from emotional disturbance, the beats become fuller and stronger as insensibility is coming on and the circulation is liberated from emotional control; but, as a general rule, the inhalation of chloroform weakens the pulse. It is often necessary to suspend the administration because the pulse has become feeble and flickering without the occurrence of any signs of respiratory difficulty. Here, in the fewest words, is a typical case of a cardiac death from chloroform. "A young lad named G. J. Weston, aged 14, died at the Royal Free Hospital whilst under the influence of chloroform. Mr. F. J. Gant, surgeon, said that, when the deceased was admitted, it was thought that the hip had been dislocated. When he examined the lad, it gave him great pain. He ordered the house surgeon to

administer chloroform. The chloroform was administered for about two minutes, during which time about sixty drops were inhaled. The deceased seemed to be half-sensible; and, on looking round they saw the lad fainting and in a dangerous state. Silvester's respiratory method and galvanism were applied, but without effect, for the lad died at once. A *post mortem* examination was made. All the organs were sound. The cause of death was syncope from the effects of chloroform." (British Medical Journal, Dec. 19th, 1874.) I have selected this case, because it is a typical example of death from sudden stoppage of the heart's action during the administration of chloroform. No one can maintain that the degeneration of the heart's walls existed in this young lad. Chloroform, however, like ether, can kill, and has killed, by interfering with the regularity of the respiration, and finally stopping it before the cessation of the cardiac contractions. Death is more avoidable when impending in this manner. The suspension of the inhalation of the anæsthetic, the free admission of fresh air to the lungs, and the performance, if necessary, of artificial respiration, will generally save the patient when dangerous symptoms of respiratory embarrassment show themselves while the heart continues to beat. But we are powerless, or nearly so, when the heart fails first. There is no room to dispute the fact that, in those recorded cases of death from chloroform in which the signs of danger have been sufficiently noted indications of cardiac failure have greatly prevailed over those of respiratory difficulty.

Just as the great danger of chloroform lies in its power as a cardiac depressant, so does the relative safety of ether consist in its action as a cardiac stimulant. No one can give ether without being struck by its favourable influence over the circulation. In most of the cases in my experience, I have found the pulse improve in force and volume during ether-inhalation. Mr. Clover, who gave chloroform for many years, and than whom we have no more careful or more experienced administrator of anæsthetics, concerning the comparative safety of ether and chloroform, writes: "Ether is undoubtedly safer; that is to say, life is not so quickly destroyed by it." (British Medical Journal, Feb. 14, 1874). In Dr. Neligan's well-known work on Medicines, edited by Mr. Macnamara, I find it stated that "the great recommendations (of ether) are the complete state of anæsthesia it produces, and the safety attending its employment—a safety so remarkable that its exclusive use has become a law in the Massachusetts Hospital."

But we may ask some further questions before we decide to give up chloroform for ether. Are the more remote ill effects arising from ether-inhalation greater than those which spring from the use of chloroform? So far as I have seen, vomiting, the chief troublesome after-effect of anæsthetics, is met with as often after one agent as after the other. Speaking of the remoter consequences of breathing ether, Mr. Clover says: "Sickness is about as frequent as after a moderate use of chloroform." Dr. Neligan mentioned, as one of the disadvantages of ether, "the subsequent persistent taste and odour of ether experienced even for days by those to whom it had been administered." There is, perhaps, a little truth in this; but, with the liberal admission of fresh air, the taste and smell of ether, which are not unpleasant to most people, soon pass away. It has been said that bronchitis may arise as a consequence of ether-inhalation. I have never met with such a result, nor with anything approaching to it. The condition which has probably been mistaken for bronchitis is one which I have observed, and one to which Mr. Clover has drawn attention in the following words. "The flow of saliva is considerable; and the larger air-tubes are often obstructed by fluid, which makes a loud moist rhonchus; but it does not appear to be of much consequence, as it passes off afterwards." Patients who have taken ether usually complain of nothing more than a slight feeling as of recovery from drunkenness. Are there any other inconveniences attending the administration of ether as compared with that of chloroform? It takes a very few minutes longer, as a rule, to produce anæsthesia with ether than with chloroform. But I have induced perfect surgical anæsthesia with ether, so as to permit the painless performance of the operation for squint, in three minutes. Ether is not quite so pleasant to breathe as chloroform, and it is more apt to

cause a feeling of suffocation during the first few inhalations. But no inconveniences of such a trivial and temporary kind as those I have mentioned—inconveniences involving time, or taste, or trouble—ought to deter us from using the safest anæsthetic we possess. If our patients were able to decide the question, safety would be the paramount consideration with them.

I have generally found it best to give a little chloroform at first. One drachm is usually sufficient. I give a drachm as a dose, poured upon a thickly folded towel, held about two inches from the patient's mouth. After this quantity of chloroform has been inhaled, ether can be borne, in most cases, without giving rise to any choking. There is rarely more effect from this quantity of chloroform than a little mental obscurity. I then give the ether, in doses of an ounce at a time, poured upon a sponge, fixed at the top of a cap-shaped inhaler, made from an ordinary bedroom towel. The inhaler I use has been devised and described by my friend Mr. Lloyd Owen. It must be applied closely around the nose and mouth; I like it to be large enough to include the nose and the chin. But little air must be admitted. The dose of ether must be renewed about every two minutes, removing the inhaler completely from the face, and allowing one or two inspirations of air, until anæsthesia be induced. When the insensibility is perfect, it may be maintained by giving smaller doses of the ether, half an ounce, at less frequent intervals. We can only judge whether to stop or continue the administration by the condition of the patient. We must give enough ether to produce anæsthesia, and we must continue to give it so as to maintain anæsthesia, so long as the operation may last. But it must never be forgotten that even ether is not absolutely safe when given to full anæsthesia. The administrator must never cease to watch the patient closely, observing, with undistracted attention, the breathing, the pulse, and the colour of the face; he must have nothing whatever to do with the operation or the operator, nor even to look at it or him; he must be wholly occupied with his own most important and responsible work. Whether chloroform or ether be given, it must be given with carefulness, but yet with confidence; "we must get rid of fear, we cannot act at all till then;" we must avoid alike timidity and temerity.—*British Medical Journal*, *Dec.* 11, 1875, *p.* 727.

106.—ON THE ADMINISTRATION OF ANÆSTHETICS.

By J. T. Clover, Esq., Chloroformist to the Dental Hospital of London.

1. I am in the habit of using nitrous oxide alone for teeth-extraction and many short operations; and for long ones, I sustain the anæsthesia by first giving ether with the gas, and then ether with very little air. This is very satisfactory on the whole, and has the advantage of shortening the period of recovery, as well as that of going to sleep. I think the uncertain amount of chloroform in methylene objectionable. I use chloroform with or without ether in operations of the eye, and those of the face or tongue, or in any operation where it is desirable to diminish the hemorrhage as much as possible. 2. I give gas and ether by my apparatus for that purpose. The supply of gas is regulated by my foot moving the screw-tap of a condensed gas-bottle. The ether supply is regulated by the hand which holds the face-piece, by turning the stop-cock leading to the ether-vessel. Ether can be given or withdrawn by this means, without removing the inhaler or letting the patient have fresh air. I use ether *P. B.*, of specific gravity .735. For giving chloroform with or without ether, I use a modification of my bellows and bag apparatus. 3. The favourable opinions as to the greater safety of ether, and the increasing alarm as to chloroform, together with improvements in the way of giving ether, have induced me, within the last four or five years, to give ether very much oftener than chloroform. 4. With the view of securing the safety of anæsthetics, I would advise them to be given to the fasting for at least four hours. No stimulants should be given by ith previously. Chloroform should not be administered to a sitting

patient without great care, nor given in proportions strong enough to excite coughing or swallowing. The pulse, as well as respiration, should be watched; and if there be a pause in the respiration, or if the pulse decidedly lose power, the inhaler should, for at least one inspiration, be taken from the mouth. Raising the chin forcibly away from the sternum should be adopted when, on account of laryngeal obstruction, the inspiratory movement fails to draw in the proper amount of air. A pause in respiration, after the patient has lost consciousness, should be interrupted directly by compressing the chest and abdomen at the same time every two seconds; but if the patient do not respire independently in less than half a minute, Silvester's method of artificial respiration should be commenced. Ether excites coughing without doing further harm, but should be more diluted after the glottis has become insensible by this or any other anæsthetic.—*British Medical Journal, Jan.* 1, 1876, *p.* 12.

107.—NELATON'S INVERSION METHOD IN A CHLOROFORM ACCIDENT.

By Lawson Tait, Esq., Birmingham.

On July 7th, whilst performing Amussat's operation on a thin, delicate, and much exhausted patient, my attention was suddenly drawn to the fact that the respiration and carotid pulsation had ceased. I tried to feel the beat of the heart, but failing to do so immediately seized the patient round the waist, inverted her, and kept her with her thighs bent over my arm and her head hanging downwards. I then directed my colleague in the case to imitate respiration by compressing the chest at intervals of about five seconds. Looking back now at the case it is probable that pulsations began to be felt at the root of the neck in about two minutes after she was inverted, but it seemed to me like a quarter of an hour; and it must certainly have been fully five minutes before she resumed respiration independent of assistance. I kept her in the inverted position for about five minutes longer.

Any one who has seen a death from the uncomplicated action of an anæsthetic must know how useless are the directions for galvanic batteries. Such appliances are sure to be out of order when most needed, and the benefit to be derived from them even when they act is very problematical.

The cases narrated by Dr. Marion Sims were enough to convince me that the inversion method, whatever may be the theory by which its success is to be explained, had rescued patients from impending death; and I am convinced that it saved me from the loss of the patient whose case I have narrated.

Since July I have used nothing but anhydrous sulphuric ether for operations, and though it is far from being so convenient as chloroform, or methelene ether, I think we are not justified in using any other anæsthetic, save in the cases of young infants and pregnant women, amongst whom no chloroform accident has yet been recorded.—*Practitioner, Feb.* 1876, *p.* 102.

108.—ON THE ADMINISTRATION OF CHLOROFORM.

By George H. B. Macleod, Esq., F.R.S.E., Regius Professor of Surgery in the University of Glasgow.

For the safe administration of chloroform, the first thing to secure is a pure spirit. I always employ Messrs. Duncan and Flockhart's, of Edinburgh, which has never failed me in efficiency. It is always desirable to prepare

your patient, if possible, for the inhalation. A purgative should be administered the day before. If the bowels be loaded, the stage of excitement is always prolonged and excessive. Food should not be given for three hours before the operation; but it is most desirable, especially in weakly persons, to allow them a fair quantity of meat, soup, and bread, at such an interval as I have mentioned beforehand; in private practice, strict and detailed orders are requisite on this point, as unsuitable food is very apt to be given, "to keep up the system." If an undigested meal remain in the stomach, there may be much annoyance and considerable danger from vomiting; while, on the other hand, an exhausted condition of the system, with diminished courage, and also trouble from flatulence and retching, will arise from too long fasting. A small quantity—a teaspoonful or two—of brandy should be given, undiluted, just before the chloroform is employed. The less bulky the form in which the stimulant is given the better, as it is less apt to be rejected. I have always followed this practice, as I believe that it comforts the patient, aids the effect of the anæsthetic, and helps recovery from it. No special preliminary examination of a patient is made in reference to his getting chloroform; as, if he be fit to be operated upon, he may not only have chloroform, but is thereby rendered more fitted for undergoing the operation. We recognise almost no disease as rendering a patient an unfit subject for chloroform; and to examine him beforehand would only augment his anxiety, and possibly discover conditions which the administrator would better be in ignorance of, as it might render him less decided in his actions, and so the patient might not be as completely under the influence of the anæsthetic as was requisite for his safety. No examination should be capable of augmenting the care and caution always to be employed. Heart-disease, in place of being a counter-indication to the use of chloroform, is often greatly alleviated by its employment; and that fatty change of the organ which is supposed to render it peculiarly liable to "paralysis," is the very form of disease in which chloroform, if properly administered, interposes the most effectual barrier between it and the fatal shock which an operation is apt to occasion. To obtain this good, however, the patient must be completely anæsthetised. If the action be incomplete, the danger is, if anything, augmented. I have frequently had to perform operations of severity when undoubted heart-disease was present, and no cases seemed to me to do better with it. A good many of the deaths under chloroform have apparently been due to patients suffering from heart-disease not being completely insensible when the operation was performed, and the shock killing them. The chloroform is blamed; whereas what was really wrong was that it was not sufficiently pushed. There are positively no cases which can be submitted to operation in which chloroform is inadmissible. Even in operations about the mouth and throat of the most formidable kind, you will here see it in use. In lithotrity and tracheotomy, also, it is nearly always employed. In some operations, the patient's help is required for a moment to effect some end; but in general this can be secured before the chloroform is given.

Various things should be placed ready to the hand before you begin to give chloroform to the patient. Here you always see an artery-forceps made fast to the corner of the pillow. I constantly have one in my waistcoat-pocket, and would never give chloroform without having this instrument at hand. Cold water, and a kettle of very hot water; a bowl with a sponge large enough, when saturated, to fill it full; aromatic spirit of ammonia and a syringe; brandy; and a chair for sitting on, should be at hand. The use of these I will afterwards explain. Make sure, also, that the window can be opened, and a current of air got.

I prefer giving chloroform early in the day. I have supposed that this renders it less apt to disagree. The patient is to be placed in the recumbent position, with a somewhat low head. Never be induced to administer chloroform in any other posture. Many accidents have arisen from neglect of this. Cover the patient comfortably, but not heavily, and never put any instruments or apparatus on the chest or abdomen. Let there be no crowding of bystanders round his head, so as to obstruct the air. The dress should be loose, especially about the throat; and females should always put

off their corsets, and loosen all constricting bands. Any false teeth which may get loose should be removed. A source of great annoyance, and, I am convinced, of danger, is extreme nervousness on the part of the patient. Many, from ignorance, dread the period of insensibility very greatly, and will excite themselves to a great pitch at the anticipation. This is very difficult to allay. They frequently tell you that they know perfectly they will "never come out of it;" and this fear is very often caused by the reading of cases of recent accident from chloroform in the newspapers. Persons who have to undergo operation not uncommonly seek out and store up such knowledge; and I am sure that, if editors of newspapers knew the harm which these otherwise useless records do in increasing the anxiety of both patients and surgeons, they would be more chary of communicating such information to the public. Hysterical anæmic women are most apt thus to cause embarrassment. We all know that excessive fear may of itself kill by syncope, and that it must act most prejudicially on the action of the heart under the circumstances we are now considering, must be conceded. Doubtless, some of the deaths attributed to anæsthetics have been solely due to this mental shock. It is remarkable how completely this alarm disappears after even one experience of the action of chloroform, and how quickly the most nervous resign themselves afterwards to its action. A nervous person, though expressing great courage, is generally "a bad breather." He either respires in a shallow ineffective way, or inhales too deeply. Either mode of breathing is objectionable. We wish the patients to respire naturally, as if nothing was being done. We desire, in short, that they think as little as possible about it. Those who breathe faintly are long in being affected, and take so much of the vapour that they are very apt to suffer from after-sickness; while those who breathe too deeply, will take it more quickly into their system than we may wish. It is well in such cases to withdraw the towel, and quietly show them how to breathe; nay, in persons who are very nervous, it may be desirable to give them this instruction, even some time before they are to be operated on. This may be done in a cheerful encouraging way; they may be even accustomed to the smell of the chloroform if great dread of it be evinced, or a little eau-de-Cólogne may be mixed with it to diminish its pungency. It is occasionally necessary, all for the same object, not to inform the patient exactly when the operation is to be performed; and you observe that, in this institution, we generally administer the chloroform to females and nervous subjects in the side room outside of the theatre, so as to avoid the trial of bringing them in before so many. Here, we always use a towel in giving chloroform. No other form of inhaler has ever been employed unless it be Skinner's simple appliance, which, many years ago, I tried without deriving such benefits from its use as to make me abandon the towel, which is so simple, so ready, and so efficient a vehicle. This is Skinner's (shown), and for children it is admirable. This drop-bottle, which allows the easy addition of small quantities, is, however, an essential part of it, and without it the real advantage of the apparatus is not secured. There is, to say the least of it, a mystery about all machines, and they are calculated to produce an apprehension which is undesirable. I have elsewhere seen various forms of inhalers used, and I have imbibed a strong objection to them. The advantage they are supposed to possess is, that they accurately measure the strength of the vapour inhaled, and prevent in from being too concentrated. In order that they should accomplish this, a certain mechanism is necessary which is liable to derangement, and which, I think, does not secure any better supply of atmospheric air than the way in which you see the towel used here. In private practice, an inhaler is troublesome to carry about, and it is expensive; but, above all, many more deaths have occurred where some form of inhaler is used than in Scotland, where a towel is the only agent employed. Do not take a towel with a fringe, as, if it fall over the patient's face, it annoys him and retards his progress. In texture, the cloth should not be too thin, and, when folded, the side without free edges—that is, the one formed by the combined doubling of the whole—should be that on which the chloroform is poured. The administrator's hand is apt to lose hold of one or more of the free edges, if they be placed in

front, and these fall down close to the patient's face, and may prove troublesome. These are trifles which, however, in their sum, count towards the result. We put no oiled silk between the folds of the cloth. The chloroform is to be liberally poured near the edge of the towel, and the cloth so held (all these points were here demonstrated on a patient) that a hand is placed on each side of the head to steady it and keep the neck straight. The towel is then pushed from each side towards the centre, so as to form a gutter in front of the mouth and nose. To do all this satisfactorily, the patient should lie on a narrow bed, where he can be approached on all sides, and the administrator stands directly above his head, looking towards the feet. At least two other assistants are required; one to stand on each side. They attend to the pulse, and are ready to command the patient's movements. There is less anxiety in the use of chloroform in hospital practice than in private life, as there are more assistants and better accommodation in every respect to be had in public institutions. The patient should be made to close his eyes and breathe slowly. Do not at first place the cloth close to the face, but hold it at such a distance as will allow the free inhalation of atmospheric air, so as to give the patient confidence; and then, after a little, it can be approximated. It may be necessary to remove it altogether time after time, so as to allow you to encourage the patient and to prevent panic. Nothing is worse than to force the process. Violent struggling and fainting may be expected if any such dangerous method be pursued. If a child cry, this is a good opportunity to get the vapour inhaled. If the patient be a male, it is useful to expose the pit of the stomach, as the movements of respiration, and frequently the action of the heart, are easily seen in this way; but too great reliance must not be placed in the movements of the abdomen and chest, irrespective of other evidence of the breathing going on. The administrator must, however, watch these movements intently, and it is not difficult for him at the same time to feel the temporal artery with the fingers which are below the towel. He must constantly, as the patient is become affected by the anæsthetic, look at the face and lips; it is there that he will at once detect any abnormal condition. Whenever the respiratory function is becoming embarrassed, the dark colour of the lips will at once give evidence of it; while, if the heart's action threaten to fail, the blanching of the lips will at once attract his attention. In old and weak people, and those who are anæmic from any cause, special attention is called for. It is always to be borne in mind that both the breathing and the pulse demand attention; for, although I very strongly incline to the belief that obstruction to the respiration always precedes the syncope of which we have heard so much, still the observation of competent and careful administrators has not so entirely confirmed that view as to entitle us to concentrate all our attention on the breathing alone. The sound of the respiration should, if possible, be constantly noticed, and all snoring or difficulty at once looked to. It is true that ordinary snoring may occur; but stertor or the snorting of obstructed breathing is a warning never to be for a moment neglected. It seems likely, from the observations of Mr. Lister, that stertor may have both a palatine and a laryngeal origin; but whenever it occurs, it is a warning note of approaching danger.

I should have said before that we never measure the amount of chloroform poured on the cloth. We do not believe that it matters much what quantity is used, so long as the effects are watched. More deaths, I fear, are due to too little than to too much chloroform being given. By this I mean that in very many cases the fatal result has been due to imperfect narcotism, and the shock of the operation having full or even augmented force on the patient. Never trust for safety to the smallness of the quantity employed. Drops may kill when drachms might save. No more erroneous proof of the efficiency of the method of administration used can be than an appeal to the small quantity which has been expended; and yet, in fatal cases, how often is that advanced as evidence of the great care which was exercised!

When renewing the chloroform, do not remove the towel, but pour it on *the outside*, and turn the cloth. In this way, much time is saved, and less *chloroform* is, on the whole, administered, as the patient is not allowed half

to recover each time that more chloroform is required. Never, under any circumstances, lay the towel down on the patient's face without your hand being below it.

To keep up the effects, the administrator must carefully watch for any evidence of returning motion; and, by the reapplication of the cloth, a mere sniff of the vapour may be enough to retain command of the condition in which we wish him to remain. The less chloroform that is used to accomplish this the better.

Perfect quietness should be maintained while the administration is proceeding. The patient's attention is excited by any talking or other noise, and he often strains to hear what is said (supposing, if he be at all nervous, that it is sure to be about himself); and in this way the influence of the vapour is delayed.—*British Medical Journal, Jan.* 1, 1876, *p.* 5.

109.—ON RAILWAY INJURIES.

By John Eric Erichsen, Esq., Senior Surgeon to University College Hospital.

[From a very able review of Mr. Erichsen's work on Railway Injuries, Concussion of the Spine, &c., in the British and Foreign Medico-Chirurgical Review, we give the following important remarks.]

In the scientific, cautious, and philosophical work which heads this article Mr. Erichsen tries to classify and arrange these anomalous cases, and endeavours with very considerable success to group the ous phenomena in something like a natural order or sequence.

The real practical difficulty in the whole question seems to be the explanation of the primary symptoms of concussion or wrench of the spine in those cases in which we have no evidence either of fracture or dislocation of the vetebræ, of separation or laceration of ligaments, of rupture of muscle, or hemorrhage, into its substance, or even of hemorrhage into the membranes or substance of the spinal cord. By exclusion we can get rid of each and all of these symptoms, and yet there are patients to whom something has happened, very difficult to explain, and yet evident in its results.

What this something is we do not know. Mr. Erichsen tries to give us an idea of it by an analogy. When a magnet is struck a heavy blow with a hammer, the magnetic force is found shaken or concussed out of the horseshoe; we do not know how this is done, but we know that it is so, and that the iron has lost its magnetic power. So if the spine is badly grazed, shaken, or concussed by a blow or shock of any kind communicated to the body, we find that the nervous force is to a certain extent shaken out of the man, and that he has in some way lost nerve power.

What immediate change, if any, has taken place in the nervous structure to occasion this effect, we no more know than that change happens to a magnet when struck But we know that a change has taken place in the action of the nervous system, just as we know that a change has taken place in the action of the iron by the loss of its magnetic force.

With reference to the effect supposed to be produced on the nervous system of the cord by the vaso-motor system producing contraction of the blood-vessels, the following interesting and suggestive passages may be quoted from Dr. M'Donnell. "When we see a large snake struck across the tail with a rod, and instantly, in the twinkling of an eye, seized with a paralysis as complete as death, which yet after a time passes off again, can we attribute such a condition to the constriction of the blood-vessels of the cerebro-spinal axis? I think not; because we know that among these animals the cerebro-spinal system does not (even after the evacuation of the blood of the body) speedily cease to exercise certain functions and perform movements; and moreover, I have proved experimentally that even after decapitation a blow across the tail stops for a while all the movements

which, under ordinary circumstances, persist for a considerable time. The effect, therefore, cannot be attributed to disturbance through the blood-vessels; it appears rather to be due to an altered molecular condition of the nervous centre resulting from the blow, and more or less persistent. That a shock conveyed to the central nervous system through its peripheral nerves should, with the instantaneousness of a lightning flash, lock in insensibility and motionlessness the entire frame of the creature, cannot, to my satisfaction, be accounted for through the action of the vaso-motor trunk upon the blood-vessels."

If this is not a theory it is an analogy, and a good one, and may be a comfort to us, but still it does not explain why it is that this extraordinary change does not occur in cases where the stroke or jar has been of severity sufficient to crush the spine or fracture a thigh or the base of the skull.

A stable-boy in love let himself down from the parapet of a very high bridge, and fell on his feet, breaking both his thighs; he never had a spinal symptom. A drunken workman leapt clean out of a fifth-story window, and fell on his heels with such force that the bones of the heel of both feet were pulverised, yet he had not a spinal symptom.

Mr. Erichsen comforts himself again with an analogy, which for the same circumstances was a great favourite of the late Mr. Syme. If a watch falls to the ground, and the glass is broken, the mechanism rarely suffers injury, and the watch may not even stop; if the glass escapes, the jar will stop the watch, perhaps even be sufficient to spoil its regularity for ever. In the case of the spine, the violence of the shock may have expended itself in producing the fracture or the dislocation, so that the nervous system escapes the jar.

There is in all probability some obscure change in the mutual relation to each other of the cells or ultimate structures of the nerve-tissue, the change which takes time to develop itself into what we can see by the microscope or trace by symptoms.

What, then, is the series of phenomena destined to end in such serious results? How are we to recognise such a case so as to be able to prognose it? Could we prevent the serious results did we recognise the nature of the case in time?

Unfortunately at the time of the accident the sufferer is usually quite unaware that anything out of the common has happened to *him*. His attention has been taken up entirely with the circumstances of the collision. He has felt the jolting of the carriage before it left the rails, or has found himself on an embankment, or under a mass of *débris*, almost without knowing what has happened. He is perhaps so delighted at having escaped with his life, and without broken bones, that in all probability he is in a preternaturally excited, even cheerful condition; runs about assisting every one, telegraphs that he has made a wonderful escape, shows no evidence of paralysis, concussion, shock, or strain, and may even take a long journey to reach his home. Then Mr. Erichsen tells us, "a revulsion of feeling takes place, he bursts into tears, becomes unusually talkative and is excited. He cannot sleep, or if he does he wakes up suddenly with a vague sense of alarm. The next day he complains of feeling shaken or bruised all over, as if he had been beaten, or had violently strained himself by exertion of an unusual kind. This stiff and strained feeling chiefly affects the muscles of the neck and loins; sometimes extending to those of the shoulders and thighs. After a time, which varies much in different cases, from a day or two to a week or more, he finds he is unfit for exertion and unable to attend to business. He now lays up, and perhaps for the first time seeks surgical assistance." Pp. 157, 158.

It is difficult to improve upon, or to correct this excellent description; but in our experience we have occasionally found the stage of exaltation and excitement last for a longer time before the patient begins to discover that he has been injured, and it is quite possible that for the first two or three nights after the accident the sleep may be sound and refreshing. Still the *patient* is not himself, he is what the Scotch call *fey*, excited, absurdly *cheerful*; in an altogether exalted frame of mind, and the longer this stage

lasts, the more complete and prolonged is the subsequent condition of depression and gloom.

Passing on to the pathological changes in the cord which lead to, or end in, more acute symptoms, Mr. Erichsen is inclined to distinguish two distinct and, indeed, widely opposed conditions, viz., spinal anæmia and spinal inflammation. Though apparently so different in character many of the symptoms of these conditions are alike, the *anæmia*, however, being in all probability a functional, and thus possibly a temporary, condition, the inflammation having organic and permanent changes in the cord substance underlying it.

Inflammatory changes of a chronic, or, at least, subacute character may come on gradually and insidiously, probably within a year from the concussion. In all probabiiity both cord and membranes will be involved in the mischief, though Mr. Erichsen, following Ollivier, tries to differentiate the symptoms of spinal meningitis from those of myelitis. As a result of both, the change in the cord is most commonly a softening, perhaps, of the white matter only, but sometimes one of induration and enlargement.

For various reasons, well given by Mr. Erichsen, there is a great lack of records of examination of the cords of those dying after spinal concussion from railway injury. One only is to be found, and this is a valuable one, from the care with which the case was observed by Mr. Gore, of Bath, and the detailed report of the examination of the cord by Dr. Lockhart Clarke.

The essential points in his report are partial thickening of the membranes and occasional adhesions to the white columns; a diminution, to a most striking extent, of its antero-posterior diameter ; disease of the posterior white columns, the nerve fibres of which had been to a certain extent replaced by compound granule-corpuscles and wavy fibrous tissue. The case, in many respects, resembles one of locomotor ataxy.

If the inflammation of the membranes is at all severe or extensive it is sure to affect the spinal nerves, either by causing undue pressure on them at their exit from the sheath, or, less likely, by extending down the neurilemma. These pains are connected with rigidity, contraction, or painful movement of the muscles of the limb.

In endeavouring to distinguish the symptoms of spinal myelitis from those of meningitis, which, as we have said, is only possible in early stages, and is not at all certain in any stage, we may, perhaps, expect cerebral symptoms to occur more rarely and pressure to elicit more suffering in the myelitis than in the meningitis. We may quote here from Erichsen the more characteristic symptoms of myelitis :

"The sensibility is first augmented, but after a time becomes lessened, and gives way to various uneasy sensations in the limbs, such as formications—a feeling as if the limbs were asleep (*engourdissement*). These sensations are first experienced in the fingers and toes, and thence extend upwards along the limbs. These sensations are most complained of in the morning soon after leaving bed. They intermit at times, fluctuating in intensity, and in the early stages are lessened after exercise, when the patient feels better and stronger for a time, but these attempts are followed by an aggravation of the symptoms. Some degree of paralysis of movement, of loss of motor power, occurs in certain sets of muscles or in one limb. Thus the lower limbs may be singly or successively affected before the upper extremities, or *vice versâ*. Occasionally the loss of power assumes a hemiplegic form. All this will vary according to the seat and extent of the myelitis. There is usually constipation in consequence of loss of power in the lower bowel. It is very rare that the bladder is early affected, the patient having voluntary control over that organ until the most advanced stages of the disease, towards the close of life, when the softening of the cord is complete. Ollivier remarks that in chronic myelitis patients often complain of a sensation as of a cord tied tightly round the body. The gait of patients affected with chronic myelitis is peculiar. It is unsteady, rolling, like that of a partially-intoxicated man. The foot is raised with difficulty, the toes are sometimes depressed, and at others they are raised,

and the heel drags in walking. The body is kept erect and carried somewhat backward."—Pp. 186, 187.

So far, then, we can recognise, with some distinctness, the symptoms of the second stage in those cases of concussion of the spine which result in a chronic inflammation, either of the cord or its membranes or both combined. A careful examination into the history and the objective phenomena, of temperature, pulse, contractility, and firmness of muscle, will generally enable the surgeon to come to a pretty accurate diagnosis, and thus to give a tolerably certain opinion and prognosis, which latter is generally an unfavourable one.

We must now attempt a much more difficult task, to follow our author in his description of the symptoms of spinal anæmia and its results, which are with great difficulty differentiated from those of so-called hysteria.

Occurring, as it does, chiefly in the young, from fifteen to thirty-five, and in a large proportion of cases in females, who had, perhaps, been always somewhat weak and excitable, this malady is apt to be mistaken for or confused with hysteria in one or other of its Protean aspects.

The chief symptoms of this malady, as given in the manuals and homologated by Mr. Erichsen, are—

Pain, induced or increased by pressure on or near the spine, and aggravated by the contact of a hot sponge. This is not permanent, is most marked when patient is expecting to be touched, is perhaps absent entirely when patient's attention is diverted.

Paralysis, in bad cases, of the whole lower limbs, which are flaccid, cold, and insensible. Erichsen says—"The condition is, in fact, one of complete exhaustion of the spinal system below a certain level, that level usually corresponding with a line drawn round the body from the tenth dorsal vertebra."

Special senses, such as *sight* and *hearing*, are often seriously impaired and temporarily weakened, or even destroyed. From the fact that this condition is never in itself a fatal malady, no post-mortem examinations are recorded.

Allied to this condition so closely as with great difficulty to be distinguished from it are found cases of mental rather than physical perturbation, which, for want of a better name, Mr. Erichsen calls hysteria, which he has never seen as results of any of the ordinary accidents of civil life, even in females, but of which he has seen many examples, in both sexes, after the more severe types of railway collisions. Whether such cases are caused by the terror and suddenness of the accident affecting the mind only, or by any special vibratory thrill acting physically on the nervous system itself, it is impossible to determine. Probably the former is the more rational explanation, as the symptoms are mental rather than physical, and they are not apt to be followed by inflammatory or degenerative changes in the substance of the cord.

We will not quote Mr. Erichsen's eloquent account of these symptoms; they are, in a word, an exaggeration of all the subjective symptoms of spinal injury, with a "nervous mimicry" of numerous diseases, aggravated by examinations, especially by the surgeons to the railway company, not in the least improved by treatment, but rapidly tending to get better after a certain number of months, and especially after the worry and anxiety of litigation is fairly over. Can we wonder that, such being the case, invidious and uncharitable remarks are made by lawyers and the suffering railway companies? and yet all through the case the *bona fides*, both of the patient and her medical advisers, may have been unimpeachable.

Mr. Erichsen would base his attempts at the diagnosis of these perplexing cases from those depending on real structural brain-lesions on three chief points :—1. That the mental condition had come on almost immediately after the injury, and has been continuous, not progressive. 2. The pain has a peculiar character of cutaneous hyperæsthesia, which is unattended by alteration in texture, loss of movement or muscular rigidity. 3. The wonderful *good* health, notwithstanding the long idleness and mental vacuity.

The prognosis in these cases is generally favourable.

Mr. Erichsen considers the various forms in which injury of the eye or impairment of vision may appear under four well-marked and distinct heads.

1. Concussion of the eyeball and direct shock to the nerve ; such injuries may be inflicted during a railway accident and the patient may hardly be able to tell how. Mr. Erichsen believes, and supports his belief by one well-marked case, that a smart, direct blow on the eyeball may at once paralyse the retina without giving rise to any organic mischief, laceration of tissue, or effusion of blood in the eyeball itself. Such cases of simple shock are most probably rare, there being more usually some effusion or laceration of the iris, choroid, or ciliary processes; in many cases some effusion of blood into the vitreous humour. Again under this head are included cases of cataract developing after a blow on the forehead or eyebrow, as a result of nerve-injury.

2. *Nerve-injury* may also explain cases of extreme mydriasis, and consequent impairment of power of accommodation, seen after blows or falls implicating the forehead and eyebrows. Some of these cases are remarkable and inexplicable, especially as to why some cases suffer from eye symptoms and others do not. A slight blow, which has hardly made a mark on the forehead, in one case setting up a slow and gradual process ending in total blindness ; another, much more severe one, having no effects at all. A case was recently observed by the writer in which a fall from a height of between 60 and 70 feet inflicted cuts of great severity over branches of fifth, both above and below orbit, and caused so great a shock as to fill the subconjunctival tissue with ecchymosed blood, and yet not a single symptom of impairment of vision followed ; while many cases are on record in which amaurosis and other eye symptoms have followed comparatively slight injuries. Among other papers on this subject we may refer to a full series of such cases reported by Mr. Benjamin Bell, Surgeon to the Edinburgh Eye Infirmary.

The ophthalmoscope has cleared up the diagnosis and greatly facilitated the prognosis of many of these cases, explaining the symptoms by subretinal effusions, lacerations of edge of the iris, &c.

3. By far the most important, insidious, frequent, and misleading symptoms are those directly caused by the spinal injury itself quite apart from any local injury to the eye or nerves—gradual weakness of vision, with a want of definition, *not improved* by glasses, passing into double vision, with photophobia, and even to the presence of permanent muscæ, flashes of light, sparks, and other subjective phenomena. Mr. John Tweedy has given an explanation of the symptoms under four heads. (*a*) Asthenopia, with want of accommodation-power for near objects for more than a few minutes at a time, the result either of impaired nerve-supply or of weakness of the ciliary muscle or internal recti. (*b*) Amblyopia, a paresis of the retina or optic nerve, rendering it incapable of receiving or transmitting impressions to the brain. (*c*) Anomalies of accommodation or refraction, hypermetropia, myopia, or astigmatism, if of sudden or rapid occurrence, are all grave symptoms. (*d*) Irritability from hyperæmia of retina, and inflammation of it or optic nerve.—*British and Foreign Medico-Chirurgical Review*, *Jan.* 1876, *p.* 4.

110:—ON PROFESSIONAL MUSCULAR ATROPHY.

By Dr. E. Onimus, Laureate of the Paris Academy of Sciences.

Activity of muscles determines the development and energy of muscular fibres, and the general law is that the more a muscle works the larger and the more powerful it gets. This law, however, has its limits, and I have just observed a certain number of cases in which the exaggerated work of certain muscular groups, far from producing hypertrophy, induced, on the contrary, a condition of considerable atrophy.

These cases are observed only in individuals who, through the nature of their trade or work, are obliged to contract the same muscles constantly.

Through excess of activity, irritation of the muscular fibres supervenes. Thus, in a man employed in a draper's establishment, and whose business was to replace the unfolded goods on their shelves, there supervened, little by little, a most remarkable atrophy of the deltoid muscles of both sides. And indeed it was these muscles which were constantly actively employed in performing this special work.

In a workman employed in a tannery, who was every day for eleven hours at work, and always felt aching and fatigued after his day's labour, there likewise supervened marked muscular atrophy, confined to certain muscles. In order to prepare the skins, he was to perform with both arms a forward and backward movement, which necessitated especially the action of the muscles of the shoulder, so that these were the first to be affected, and are at present almost completely atrophied. The wasting away is almost the same in both arms, as both were in action during the man's work, whereas, in respect to the legs, the right one alone was obliged to support the whole weight of the body. Consequently, with the lower limbs, the right leg is the only one that has wasted ; it is one half smaller than the other, and the affected muscles are those the action of which was the most constant, such as the rectus femoris, vastus externus, and vastus internus.

In the beginning the patients complain especially of prostration, of weakness even in the morning on getting out of bed. They feel—particularly at the outset of the disease—intense, darting, intermittent pains. Before atrophy is well marked there always exists more or less temporary contraction of the muscles.

When wasting has once begun, it follows a most rapid course if the patient continues to fatigue his muscles.

Almost always this affection is mistaken for progressive muscular atrophy, but it differs from it in its course and in a great many of the symptoms. 1st. The muscles which are the first to be affected are generally the largest ones, and particularly those in the neighbourhood of the shoulder-joint. 2nd. The pain and cramps at the outset are also a distinctive sign. 3rd. These cases of wasting amend rather rapidly under the influence of rest and the use of constant and continuous electric currents.

Recently I observed one case which it was most difficult to differentiate from progressive muscular atrophy, as the atrophied muscles were the same as those which are the first affected in this latter affection. They were the muscles of the thenar eminence, and chiefly the abductor pollicis. The patient was an enameller, who had to hold an object all day between his thumb and index-finger. He first got cramps in the thumb, which suggested the idea of scrivener's palsy, then tremor of the thumb, on account of the fibrillar contractions, and, lastly, atrophy. Under the influence of treatment there was a rapid amendment, which showed that the case was really one of professional muscular atrophy, and not commencing progressive muscular atrophy—*Lancet*, *Jan.* 22, 1876, *p.* 127.

111.—ON THE EXTERNAL USES OF HYDRATE OF CHLORAL.

By Dr. WILLIAM CRAIG, F.R.S.E., Lecturer on Materia-Medica, Edinburgh School of Medicine.

[In addition to its hypnotic effects chloral is a powerful antiseptic, and may be used for a variety of purposes, such as the preservation of anatomical preparations, the injection of bodies for the dissecting-room, and for the dressing of wounds. The following are the conclusions arrived at with regard to its value for *dissecting-room purposes.*]

1. Bodies injected with the hydrate of chloral are preserved from decay equally well as when the ordinary preservative fluids are used.

2. If exposed to the air, or carelessly attended to by the students, the *tissues* become very black, and give off a disagreeable mawkish odour.

3. Delicate nerve-plexuses can be more successfully dissected out when the bodies are injected with chloral solution; and,

4. It is much cheaper than other preservative fluids.

[A solution of 5 grains of chloral to the ounce of water preserves *anatomical preparations* better than spirit.]

As a dressing for wounds and ulcers.—I have tried chloral extensively as an external application to wounds and abraded surfaces. I found as the result of these experiments that a lotion containing from 5 to 15 grains of the hydrate of chloral to the ounce of water formed an excellent dressing to ulcers and wounds, dressed with lint and gutta-percha in the ordinary manner. I could relate several cases, but I will select only one. A young lad, T. M., lately one of the boys in the Mars training-ship, had one of his legs severely burned, and after being treated by the surgeon in charge of the ship for three months, the boy was recommended to go into Dundee hospital to have the limb amputated below the knee. As T. M. was within a fortnight of receiving his discharge from the ship, he was allowed to visit his friends in Edinburgh, who were unwilling that the leg should be amputated, and put the boy under my care. I saw him in April last, and found a large ulcer on the leg, extending from a little below the knee to the middle of the foot, and several inches in breadth. The edges were very irregular, and a considerable amount of fœtid discharge came from the ulcer. The boy and his friends were very anxious that I would try and preserve the limb. I ordered a lotion containing 15 grains of the hydrate of chloral to the ounce of water, some chloral lint, such as is manufactured by J. P. Macfarlan and Co. of this city, as recommended by Dr. P. H. Watson, and some gutta-percha, and gave instructions for having the limb dressed twice daily with these. I may mention that previously it had been dressed with some preparation of carbolic acid. After the chloral dressing the limb healed rapidly. The ulcer got gradually less, the fœtid discharge disappeared: and when I saw the patient in July last, only a small ulcer remained, and even that was gradually diminishing in size, notwithstanding the fact that the boy was daily employed in a large drapery shop in town, and was unable to give the leg that rest which was necessary, and which I had so much recommended. The boy is now a sailor, and is at present on a voyage to Athens. I also used chloral solution as an injection into the sacs of large abscesses, and found that it tended much to diminish secretion and make the parts heal. I found it also a useful lotion for the eye in inflammatory conditions of that organ. It is an excellent application to burns, and very specially where there is a fœtid discharge. I also found it a good application to remove warts from the hands and fingers. I used for this purpose a lotion containing 15 to 20 grains to the ounce of water, applied by means of lint and gutta-percha. It causes no pain, and the wart speedily becomes smaller, and gradually disappears.

I also used it as a lotion to sore nipples and to inflamed mucous membranes. When chloral is applied to an ulcer, a wound, or to the interior of an abscess sac, it causes at first some smarting, but that only lasts for a few minutes, and is soon succeeded by a most agreeable sensation. Patients so treated have frequently told me that soon after the lotion was applied a very agreeable soothing effect was felt in the wound. I believe that in all such cases chloral acts as a local sedative. It produces anæsthesia of the nerves of the part. Wherever there is a wound or ulcer there is irritability of the nerves of that part; and chloral, by soothing this irritability of the nerves, favours the healing process.

I have frequently used with good effect an ointment containing 30 to 60 grains of the hydrate of chloral to the ounce in eczema and other allied affections. I believe it to be one of the best applications in such diseases; and a medical practitioner lately told me that he had used it with marked benefit as a local application during an attack of erysipelas of the head. Chloral in various forms has been extensively used in the Royal Infirmary of this city by Dr. P. H. Watson, senior surgeon to that institution, and I have the honour of appending a letter from him giving an account of his experience of hydrate of chloral as a dressing to wounds:—

"I have in my wards made use of the chloral hydrate for fully six months, and find it quite as active as an antiseptic as carbolic acid or boracic acid. It approaches nearer to carbolic acid in its effects than to the boracic acid, especially in that it is volatile, and thus by its vapour penetrates and surrounds parts to which as a dressing it has been applied with an atmosphere of itself.

"It has a marked advantage over carbolic acid, in so far that its odour is pleasant, resembling some of the ethereal compounds employed for flavouring purposes. It also is absorbed, and, in being so, deadens pain after an operation.

"I employ it in *four* forms :—

"1. A lotion of 5 to 40 per cent. in water, for cleansing away discharges around a wound, cleansing sponges used in operations, and analogous purposes.

"2. An ointment composed of concrete paraffin, white wax (Scotch), and almond oil, to which 1-12th to 1-8th of chloral is added, while the other ingredients are liquefied by heat. The components of the ointment should at once be rubbed together, covered, to prevent the evaporation of the chloral, and cooled to a concrete form as rapidly as may be. It is afterwards rubbed up with a few drops of the solution of chloral to disintegrate it, and prevent its crystalline form being reassumed. This ointment takes great pains to make efficiently. If not properly prepared, it is either inert, containing sometimes, I find, absolutely no chloral; at other times (if made cold) the chloral is so imperfectly mingled that it acts as an irritant, and blisters tender cutaneous surfaces. The ointment is applied spread into the substance of linen cloth, so as to be incorporated with the material. This dressing forms the immediate application to the surface around the wound, and covers in the wound itself. It does not adhere, but peels off like a thin layer of wax.

"3. An external excipient dressing is made by soaking lint in a solution of chloral (ʒ i. ad ʒ j.). It is then wrung out of this and carefully dried. The care is necessary to avoid long exposure or a high temperature, as this volatilizes the chloral.

"4. Lint soaked in a solution of chloral in olive-oil (1-8), employed to fill cavities such as those left in some excisions, and to employ as compresses when it is desired to prevent bleeding from the cut surfaces in operations for the removal of *dead* bone.

"In some cases, when the chloral appears to act as an irritant, even when carefully prepared, it may be necessary to interpose some impermeable material between the line of operation and the dressing.

"I have never met with any disagreeable results from the absorption of the chloral. On the contrary, I have found the pain of recent wounds only satisfactorily modified and relieved by its employment."—*Edin. Med. Journal*, *Feb.* 1876, *p.* 711.

112.—ON THE DANGERS TO THE EAR OF BREATHING BY THE MOUTH.

By Dr. Guye.

At the international medical congress in Brussels, in 1875, Dr. Guye read a paper in the otological section (Archiv fur Ohrenheilkunde, February 4, 1876), on the dangers to the ear of breathing by the mouth. According to the author, the habit of breathing by the mouth, frequent among deaf people, is a very pernicious one, and he is much surprised at the almost entire absence of papers on the subject. Respiration by the mouth, which is easier than respiration by the nose, cannot with safety be substituted for it, as nasal respiration answers certain requirements which oral breathing cannot supply. The function of the nose in respiration is threefold. 1. The olfactory sense secures it against the entrance of impure air. 2. The moisture of the nasal passages gives a certain degree of aqueous saturation to the inspired

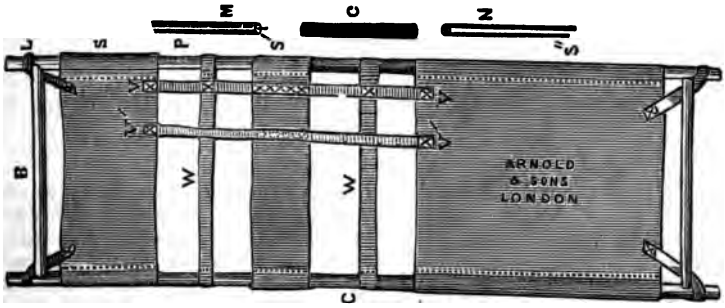
air, the contact of which is thus rendered less irritating to the mucous membrane of the throat and larynx. 3. The inequalities of the organ retain solid particles suspended in the air, which is proved by the quantity of dust sometimes found accumulated in the nostrils.

These advantages are absent in respiration by the mouth. The contact of dry air soon produces circulatory troubles in the pharyngeal region, and even an habitual catarrh, susceptible of easy transmission by continuity to the Eustachian tube and cavity of the tympanum. Granular or adenoid pharyngitis often has this origin. In support of his opinions the author adduces the authority of Dr. Paul Niemeyer of Magdeburg, who considered that the attacks of pseudo-croup to which children are often subject during the first hours of the night, had their origin in dryness of the glottis produced by oral respiration. To obviate this inconvenience the principal object was to restore the nose to its proper condition, and for this purpose it is important to oblige the patient to breathe by the nose. As we cannot rely on the will of the individual, especially if a child, Dr. Guye proposes to produce occlusion of the mouth by a little instrument of the shape of the respirator, but differing from it in this essential particular, that it is entirely impermeable to air. This "contra-respirator," as the author calls it, constitutes a simple and easily-applied means which has produced excellent results in Holland. Dr. Guye cited cases of catarrhal deafness which he had completely cured by this means alone, without any other treatment. [The danger to the Eustachian tube of breathing by the mouth was recognised by Mr. Toynbee, who, in his work on the Diseases of the Ear, in speaking of the treatment of obstruction of the faucial orifice of the Eustachian tube by thickened mucous membrane, advised the patient to practice nasal respiration.—*Rep.*]—*London Medical Record*, *March* 15, 1876, *p.* 130.

113.—DESCRIPTION OF A FORM OF STRETCHER.

By CHARLES R. B. REETLEY, Esq., Assistant-Demonstrator of Anatomy at St. Bartholomew's Hospital.

In many cases of typhoid and other fevers, of peritonitis, and other inflammations, of bedsore, of various chronic diseases, in many surgical and in obstetric cases, it is very desirable to have a mode of moving a patient from room to room or from bed to bed, and a mode of changing the patient's bed and body-linen without causing the least avoidable disturbance or excitement. For such cases this apparatus has been contrived.



The chief principles on which it is constructed are: 1. It can be placed under the patient piecemeal, and afterwards easily and without danger of mistake fitted together again. 2. It is only a skeleton of webbing in the part which sustains the back and buttocks, and thus allows bedsores and blisters to be easily dressed. 3. The cutaneous sensibility of the back is so extremely

blunt that the network of webbing, coarse as it is, feels like a whole and undivided piece.

Its chief advantages are : 1. The most sensitive or feeble patient can be freely moved with no sense of discomfort and no dangerous disturbance. 2. Bedsores and blisters on the back can be easily dressed though its means, and even the back percussed or auscultated through it. 3. Its details can be easily modified by any needle-woman to suit the necessities of particular cases without altering the apparatus in principle. 4. It is light and portable, it packs into a parcel three feet long and five inches in diameter.

In using it the pieces s, s', s'', w, and w', are passed under the patient gently, one by one; and the poles then slipped through the hems and loops. Two chairs, each having one of the cross pieces, B, upon it, can sustain the patient while the bed is made, &c.

The stretcher has been used with satisfaction at the Queen's Hospital, Birmingham, and at St. Bartholomew's Hospital, London. It is made by Arnold & Sons, West Smithfield, London, E.C.—*Lancet*, *Jan.* 8, 1876, *p.* 48.

The Pellicles of Diphtheria and Scarlatina contrasted.—The pellicle of diphtheria is a leathery membrane, tough and difficult to tear. It is not the product of "inflammation" in the ordinary acceptation of that term. It has as its basis a peculiar fluid exuded from the surface on which it rests. This fluid, which may be described as cacoplastic lymph, agglutinates a profusion of epithelial cells. The membrane thus formed consists of compact tenacious layers, which give it a stratified appearance. The pellicle of scarlatinous sore throat, on the other hand, is pultaceous and easily torn. In cases of scarlatinous gangrene of the tonsils, the substance which simulates the false membrane of diphtheria will, on examination, be found to be sphacelated mucous membrane, with the addition of a pultaceous substance

ERRATA.

By a mistake in the printing-office the pages of references in the Synopsis were left unchanged as in the English copy, and were not made to correspond with the American edition.

47	on	page	255	should	be	46	203	on	page	268	should	be	140
17	"	"	256	"	"	27	114	"	"	268	"	"	89
22	"	"	256	"	"	30	186	"	"	269	"	"	135
9	"	"	256	"	"	22	189	"	"	269	"	"	137
55	"	"	257	"	"	51	193	"	"	270	"	"	140
33	"	"	257	"	"	37	201	"	"	270	"	"	145
34	"	"	257	"	"	38	213	"	"	270	"	"	153
16	"	"	258	"	"	26	123	"	"	271	"	"	94
31	"	"	258	"	"	36	151	"	"	272	"	"	112
66	"	"	258	"	"	58	119	"	"	272	"	"	92
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87	"	"	259	"	"	72	245	"	"	274	"	"	174
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165	"	"	261	"	"	121	266	"	"	278	"	"	188
163	"	"	261	"	"	126	294	"	"	278	"	"	209
170	"	"	262	"	"	125	315	"	"	278	"	"	219
158	"	"	262	"	"	117	290	"	"	278	"	"	203
104	"	"	263	"	"	83	300	"	"	279	"	"	209
102	"	"	263	"	"	81	225	"	"	280	"	"	161
330	"	"	264	"	"	229	284	"	"	280	"	"	199
181	"	"	264	"	"	132	281	"	"	280	"	"	197
177	"	"	265	"	"	129	318	"	"	281	"	"	221
205	"	"	265	"	"	147	335	"	"	281	"	"	232
206	"	"	265	"	"	148	344	"	"	282	"	"	238
198	"	"	266	"	"	143	341	"	"	282	"	"	236
199	"	"	267	"	"	144	363	"	"	282	"	"	250
259	"	"	267	"	"	183	51	"	"	283	"	"	40
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SYNOPSIS,

(ARRANGED ALPHABETICALLY,) CONTAINING

A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME, SHOWING AT A GLANCE THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS DURING THE HALF-YEAR.

AFFECTIONS OF THE SYSTEM GENERALLY.

DIPHTHERIA.—The particles which form the *materies morbi* of diphtheria implant themselves at first upon the mucous membrane of the throat, and there become developed into a dense fungoid growth. The disease is distinctly a local one at first, unattended by constitutional symptoms. These manifest themselves with a rapidity proportionate to the health of the patient at the time of attack. In the treatment our chief aim is to prevent the vital energies succumbing to the prostrating effect of the poison as it enters the system. The dietetic treatment must be simultaneous with local and general medical treatment; but the most important, in my opinion, is the local application of substances which destroy the poisonous properties of the deposit on the throat. This consists of carbolic and sulphurous acids along with the liquor ferri perchloridi. My application generally consists of carbolic acid, one part; sulphurous acid, three parts; solution of perchloride of iron and glycerine, of each four parts. This is either applied with a large camel-hair pencil or by means of the spray apparatus, at intervals of two hours. The mouth should also be frequently rinsed out with a weak solution of Condy's fluid in water, and the following mixture taken in dessert-spoonful doses every two hours: ℞. Potassæ chloratis ʒiij; acidi sulphurosi ʒiijss; tincturæ ferri perchloridi ʒiij; glycerini ℥i; aquæ q. s. ad ℥vi. M. In this way medicament is applied to the throat every hour, and, to be successful in curing the disease, this energetic treatment is absolutely necessary. Of course, if the patient be sleeping, the usual rule must be observed: viz., never disturb a patient if asleep. (Dr. R. Bell, p. 47.)

The Pellicles of Diphtheria and Scarlatina contrasted.—The pellicle of diphtheria is a leathery membrane, tough and difficult to tear. It is not the product of "inflammation" in the ordinary acceptation of that term. It has as its basis a peculiar fluid exuded from the surface on which it rests. This fluid, which may be described as cacoplastic lymph, agglutinates a profusion of epithelial cells. The membrane thus formed consists of compact tenacious layers, which give it a stratified appearance. The pellicle of scarlatinous sore throat, on the other hand, is pultaceous and easily torn. In cases of scarlatinous gangrene of the tonsils, the substance which simulates the false membrane of diphtheria will, on examination, be found to be sphacelated mucous membrane, with the addition of a pultaceous substance

—a loose epithelial detritus. In a word, the important diagnostic distinction consists in the diphtheritic pellicle being a strong, tough membrane, and the scarlatinous simulation of it being a pultaceous, easily torn stratum of detritus, or a portion of gangrenous mucous membrane. (Sir J. Rose Cormack, p. 44.)

FEVER.—It is established on grounds which do not admit of any question, that a fevered man or animal discharges more nitrogen than a healthy person or animal on the same nitrogen income; and that, as regards man, the febrile excess amounts to something like three-quarters of the normal expenditure. We have also seen that in man there is during fever an excess of discharge of carbonic acid, and that this cannot be accounted for as the mere result of excessive respiration, but that no such excess is observed in the dog. We have now to bring these facts into relation with each other. In health, the whole of the nitrogen discharge is derived from food. In inanition, when nitrogen income vanishes, all the nitrogen which passes out as urea or otherwise is derived from stored or tissue albumen. In fever this is also the case, for the nitrogen income is as defective in the one condition as in the other; but besides the using up of stored albumen, there is an additional and altogether abnormal disintegration which, for reasons already stated, we believe to take place at the expense of blood corpuscles, of muscle or other tissue. That fact must be taken as a starting point in any attempt to understand the febrile process as a disorder of nutrition. (Dr. J. Burdon Sanderson, p. 17.)

Cold Water Treatment of Fever.—The application of cold water in fever cases seems to be more and more used. The matter itself is very simple. If a patient at 40° C. (104 F.) is placed in a bath at a lower temperature, he must quickly part with heat. In fever, the natural regulation of heat which keeps our body at an almost equal temperature is insufficient. The cool bath makes up for this. If we measure the temperature after the bath, we shall find it lower than before. The blood that surrounds the cells of our nerve centres is less hot. The patient therefore feels stronger and quieter. Cold baths (15–20° C.=60–68 F.) have the clearest effect. Extensive experience has taught that their action is most positive when they are short and often repeated. Very weak patients must begin with 35° (97 F.), and then the warmth must be lowered to 20° (68 F.), by carefully and gradually adding cold water. In the meantime the body should be gently rubbed. (Dr. C. Binz, p. 22.)

ENTERIC FEVER.—Dr. Klein has discovered the presence of minute vegetable organisms in cases of enteric fever. The facts which have been put together by the most able and experienced pathologists tend to show that the contagion of enteric fever is due to a specific and living organism which, when transmitted from a diseased to a healthy individual, produces the same disease in the latter; and, further, that the chief, if not the only, vehicles of poison are the ejecta of the bowels of an infected person. Contagion in the form of a living organism could not be expected to produce infection at once; and the theory that it is organised is *primâ facie* justified by the circumstance that a period elapses between the reception of the contagium and the manifestation of the disease, during which the poison apparently lies dormant, but is in reality ripening towards an active condition. According to Dr. Klein, no other view of the poison affords any explanation of the incubation-period. But hitherto no one has succeeded in pointing out any specific organic form as the probable cause of enteric fever, and hence the paper which Dr. Klein has prepared is one of the highest interest. (Dr. Klein, p. 9.)

MALARIOUS FEVERS.—*Subcutaneous Injection of Quinine*—Quinine may be administered hypodermically in cases in which for any reason a rapid action is necessary, or in which the stomach is too irritable to bear its administration in the natural way. I determined to give subcutaneous injection of quinine a fair trial in the Bombay House of Correction, using six minims for a dose of the following preparation:—Citric acid, three hundred grains; quinine, eighty grains; distilled water, one ounce. To be dissolved with the aid of heat (six minims of this solution being equal

to one grain of quinine). I think it may be conceded that the fever yielded as soon as when treated per os, if not sooner, the table showing that in most cases the attack was arrested on the second day, and in no case later than the fourth, notwthstanding the irregular mode of treatment as to time, &c., consequent on the patients being prisoners in a gaol. Beyond all question there was a great saving in the quantity used, the cases being conducted to a satisfactory conclusion, so far as fever was concerned, with a very moderate expenditure of quinine. This mode of treatment, however, on further trial, was found to occasionally produce sores, unless the cases were carefully selected in which it was used, and there were other disadvantages. My impression is that when the orthodox channel is closed in consequence of the intolerance of the stomach, or otherwise, and when the weakly state of the patient renders it not unlikely that the subcutaneous tissue may resent this short cut into the system at its expense, the wiser plan would be to exhibit the drug per anum; but the circuitous route per os, when practicable, is incomparably better and safer, and quicker too, should the short cut have the penalty of ulceration attached to it. (Surgeon-Major G. Y. Hunter, p. 55.)

Rheumatic Fever.—*Salicylic Acid.*—For internal administration the acid must be prepared by repeated crystallisation, so as to be chemically pure. Its shining white acicular crystals have no smell, and dissolve completely in water and alcohol. This pure acid can be given internally in considerable doses without any of those unpleasant results which have followed the use of the commercial acid, which probably owes its caustic properties to the presence of other substances—for instance, carbolic acid. The pure acid only excites some dryness in the mucous membrane of the mouth and pharynx, followed by an increased secretion from their surfaces. This inconvenience can, however, be obviated by giving the acid in half-gramme or gramme doses every hour, in the form of powder, and enclosed in a capsule; and in the treatment of rehumatic fever the administration is continued until the joints which were previously affected can be moved without pain. To quote Dr. Stricker's words, "All the patients thus treated were not only relieved of their fever, but also of the local symptoms—*i.e.*, the swelling, redness, and especially the painfulness of their joints,—within forty-eight hours; most of them even within a much shorter period." (Ed. of Med Times and Gazette, p. 33.)

Salicin.—In the absence of any remedy worth calling such for acute rheumatism, we recommend a trial of salicin. It long enjoyed a reputation for tonic and febrifuge properties. It has of late years however gone out of use. It produces no deleterious effects given internally in large doses, and in doses of twelve grains every three hours in a case of acute rheumatism it caused a fall of temperature (in the first case related from 102·8 to 99·6), and abatement of pain and swelling. The salicin may be given simply in powder, mixed with a little cold water. The more acute the case, the more marked the benefit produced. In acute cases, its beneficial action is generally apparent within 24, always within 48, hours of its administration in sufficient dose. Given thus at the commencement of the attack, it seems sometimes to arrest the course of the malady as effectively as quinine cures an ague, or ipecacuanha a dysentery. (Dr. Maclagan, p. 34.)

Saccharated Lime as a Stomachic in Typhus Fever and other Complaints.—The two points most necessary to insist on in the administration of this remedy are probably large doses and copious dilution. A teaspoonful of the pharmacopœial "liquor," given after meals, is necessary, in most cases, to develop its effects as a stomachic, and should be diluted in three or four ounces of water; but in cases in which there is foulness of the tongue from acute causes, much the best plan is to fill a tumbler with water, introduce as much of the solution of lime as can be added without giving a very disagreeable taste, and let the patient drink of the mixture *ad libitum*; and when one tumbler is finished let another be filled. In fever it has no specific virtue, but in many instances I have had occasion to observe that when an hospital patient had a black, parched, and cracked tongue, like a cinder, with the teeth and lips black with sordes, saccharated lime being ad-

ministered freely, the tongue was moist the following day, and in a few days the black crust had entirely loosened and disappeared. It is not suitable, however, when there is inflammation of the stomach, or great irritability indicated, for example, by central redness of the tongue, with sharp ragged edges. (Prof. Cleland, p. 16.)

SALICYLIC ACID AS AN ANTIPYRETIC.—Salicylic acid is a most valuable antipyretic when administered for this purpose. It is necessary that each dose should be a large one, as small or divided doses have little or no effect. Generally speaking, the minimum dose required to reduce the temperature effectually is 5·0 grammes (77 grains). Should such a dose have no effect, one may after four or five hours with safety give a second, or indeed even a third similar dose. I have seen cases in which 15 or 20 grammes of the salt have been given during twenty-four hours without any ill effect. The salt is readily soluble in water, and is taken by most patients without complaint. In those rare cases in which malaise or vomiting occurred three or four drops of chloroform sufficed to remove them. I have collected the results of one hundred single doses in cases of typhoid of nearly equal severity. In order to test the value of the drug more accurately, it was always given at midday, before the usual afternoon rise of temperature. Almost immediately, the temperature began to fall, the maximum result being reached, in most cases, from four to five hours after the administration of the medicine, but in some cases not less than eighteen to twenty hours were required. The subsequent rise of temperature was as gradual as its fall, but in mild cases it never reached the same height as before. (Dr. C. A. Ewald, p. 31.)

AFFECTIONS OF THE NERVOUS SYSTEM.

DUCHENNE'S PSEUDO-HYPERTROPHIC PALSY.—This disease is a curious and probably comparatively rare one. Its pathology is not yet made out, but it is probably owing to some change in the vaso-motor nervous system. The characteristic symptom is enlargement or hypertrophy of various muscles of the body, so that the little patient looks like an infant Hercules. This is not accompanied by increase, but by lessening of the power of the affected muscle. The most common parts to be attacked are the muscles of the calves of the legs. Duchenne believes that the paralysis is due to a lesion of the vaso-motor system, and calls to witness the alterations of capillary circulation and temperature, though no lesion of the ganglionic system has been as yet demonstrated. As to the prognosis, the general opinion may be stated to be that in the first stage, before the muscles begin to enlarge, the prognosis, though grave, is not fatal; but that with the second period (that of enlargement) that hope leaves us; and still more is this so in the third or period of atrophy and debility. The treatment includes the usual hygienic measures—baths, frictions, and shampooing, the iodides of iron, of potassium, strychnia, or nux vomica, and where there are cerebral symptoms the bromide of potassium has been found very useful. Tonics are indicated, arsenic, cod-liver oil, and Parish's chemical food (the compound syrups of phosphates), have also been used with benefit, and probably free phosphorus in some of its therapeutic forms might be of value. But of all means within our power, the most promising is the prolonged and careful use of electricity in the forms of the induced and the galvanic current. (Dr. W. H. Barlow, p. 66.)

ELECTRICITY AS A THERAPEUTIC AGENT.—The value of electricity for the relief of pain is hardly yet properly appreciated by the profession. Stöhrer's continuous current battery with thirty cells is the one I use, and I have not yet met a case in which a greater number of cells was required; it may *be well* to add that the sponges supplied with the machine are far too *small*. I use whole Turkey sponges, from two to three inches in diameter,

firmly tied over the ends of the ordinary electrodes; by this means, the sponges being well soaked in water, or salt and water, the burning sensation so much complained of, especially when the application is made to the rectum, is greatly reduced. In every case it is better to begin the application from a few cells only, and gradually increase the strength of the stream to the point required, as the greatest difference in the effects produced will be noticed in different individuals. In cases too where the sponges have to be applied to the head or spine the patient should constantly be asked if their is any dizziness, and if this supervenes the application should be immediately discontinued. Neuralgias of the face, even of one or two years' standing, may be relieved by electricity. Hardly anything relieves neuralgia of the face due to pregnancy, but it may not infrequently be relieved by two or three applications of the continuous current. The cure of sciatica is almost certain when thirty cells of Stöhrer's battery are used. (Dr. Leslie Jones, p. 58.)

Hemiplegia on the Same Side as the Brain-Lesion.—Although it is quite true that, as a rule, hemiplegia is on the opposite side of the body to the lesion of the brain producing it, yet there certainly are cases in which it has been on the same side as the brain disease. In a very large number of cases paralysis has appeared on the side of the encephalic lesion, when it existed in or on the pons Varolii, the cerebellum, the crus cerebelli, the medulla oblongata, or other parts of the base of the brain. Indeed, *in cases of disease of the petrous bone, or of the surface of the encephalon near that bone, paralysis, if it occurs at all, will appear as frequently on the side of the lesion as on the opposite side.* (Dr. Brown-Séquard, p. 74.)

Nervous Headache.—*Nitrite of Amyl.*—The use of nitrite of amyl in nervous headache was first suggested by the late Sir James Simpson. He stated that he found the inhalation of two drops of the nitrite give immediate relief, however severe the pain. The following is the best mode of administering it. Place two drops on the palm of the patient's hand, and quickly diffusing these with the finger over the palmar surface, tell her to cover her mouth and nose with her hand, and to inspire deeply and quietly. No time should be lost after the nitrite is dropped on the hand, as it evaporates rapidly. The patient should be seated while inhaling, as the peculiar effects of the nitrite are produced almost instantaneously, and may occasionally alarm a very nervous or hysterical female. Fortunately these symptoms last a very short time—generally less than two or three minutes—and with their cessation the pain almost invariably ceases. Two drops may be given as a draught in water, instead of by inhalation, but the latter mode is much more satisfactory. (Dr. A. Douglas-Lithgow, p. 87.)

Neuralgia.—*Chloride of Ammonium.*—Although it seems difficult to say in what class of cases precisely chloride of ammonium is likely to prove of use, it is well worth a trial in obstinate cases which have resisted other treatment. Dr. Young (of Florence) relates a case of obstinate neuralgia of the ovary in which 15 grains of the chloride was given every two hours till three doses were taken. This, along with a pessary containing bromide and belladonna, gave complete relief at the period of greatest intensity of pain. The next access of pain was successfully treated in the same manner. This time the cure remained permanent. (Dr. D. Young, p. 83.)

Pain.—*Subcutaneous Injection of Water.*—It is a curious fact that subcutaneous injections of water often relieve pain just as effectually as when morphia is used. Nerve pains, neuralgia, sciatica, and the like are more likely to be relieved than the sufferings incident to chronic progressive diseases, as cancer. As to the manner of injection and quantity of fluid to be introduced, Dr. Dieulafoy recommends that the seat of greatest pain should be searched for, and eight or ten drops of water be there injected. This, he says, may be repeated ten, twelve, or fifteen times at one sitting, if necessary. Dr. Lafitte, in a letter to l'Union Médicale of Oct. 5th, 1875, says that he injects two grammes and then waits a couple of minutes, and if the pain be not relieved he then injects two grammes more. Even five or six syringefuls may be sometimes injected. He thinks that less than two

grammes or more than ten should never be injected. (Mr. R. Clement Lucas, p. 153.)

I have attended many patients who had been in the habit of taking morphia, and have treated them with the hot-water plan, to the great improvement of their health, and the weaning them of the baneful poison. Even in cases of delirium tremens which had been accustomed to the injections, and in the fury of delirium persisted in calling out for them, I have employed the hot water and so lulled them to rest. But here I would pause to admit that sometimes this plan would fail me, and then I would fall back upon the injecting a small dose of morphia first, following it up with the use of the hot water in two, three, or four hours. But it is in the cure of sciatica and deep-seated pain, as well as in brow-ague and similar distress, that I have found the hot-water injections most beneficial; indeed, I cannot recall an instance of failure. For the purpose of carrying out this method of cure, I had, in 1868, a hypodermic syringe made after my own plan. The needle is some inches in length; the cylinder is silver (I had broken many glass tubes or cylinders when drawing in the hot water), and contains a drachm and a half of fluid, if such an amount should be required to be thrown in. The piston has not a screw action, but runs up and down like an ordinary syringe, in order that the water may be expelled with the amount of force the operator may think best. In some instances, burying the needle up to the very end, I force in the hot water amongst the muscles, and then withdraw the instrument immediately afterwards, placing the tip of my finger on the perforation point, and, by a rolling movement, dispersing the fluid in its bed. The long nozzle of the syringe acts as an acupuncture needle; the fluid as an additional counter-irritant; the patient complains of a smarting, burning, sensation, soon followed by relief from the pain; and, if the operation be done in the patient's own home, and while he is in bed, sleep will often supervene. In this manner, I have frequently stopped sciatica, the agony of acute lumbago, or that resulting from a sudden strain or fall, besides other minor pains. (Dr. G. de Gorrequer Griffith, Brit. Med. Journ., Dec. 4, p. 702.)

Phosphide of Zinc in some Diseases of the Nervous System.—Phosphorus has taken, during the last few years, a most important place in therapeutics, both as modifying the nervous system and improving its impaired nutrition. About eight or ten years ago, M. Vigier, a very learned chemist of Paris, pointed out the advantages of phosphide of zinc. This preparation is much more stable, more definite, and more easily handled than phosphoric oil, which is commonly employed. Whilst the phosphoric oil is very easily altered by oxidation, and untrustworthy in its effects, no variation of power, no change of composition takes place in the phosphide of zinc. Four milligrammes of this substance contain one milligramme of phosphorus, but in reality, according to the researches of M. Vigier, the physiological action is equivalent to only half a milligramme. I always prescribe two pills of four milligrammes each to begin with, and proceed gradually to six pills when the physiological effects, which must be carefully observed, do not seem to be sufficiently marked. If any signs of intolerance appear, I suspend the course for some days, to begin again afterwards in the same way. Generally, after twelve or fifteen days I allow the patient to take rest, and discontinue the medicine during four or five days. (Dr. de Mussy, p. 328.)

Sciatica and Neuralgia.—*Galvanism.*—It depends on the cause of the sciatica or the neuralgia how the galvanism is used, and if the cause is decided on, then the amount of galvanism applied would be, up to a certain amount, as a tonic and stimulant to a nerve which is asthenic; the cells used would be few, and the application light. But if the complaint has been caused by cold, sitting on a wet seat, gout, &c., and the nerve is tender when pressed upon, and the pain very acute, then the cells must be very much increased, and the poles pressed well into the part. The operation should be only for a few minutes, but severe. Sometimes around the cutaneous parts on which the charcoal points have been

placed there occurs a herpetic eruption. If galvanism is applied in this case it is the most powerful counter-irritant possible, and the relief to the sufferer is very great. (Mr. S. J. Knott, p. 85.)

SLEEPLESSNESS.—*Hypnotics in.*—The use of *opium* is rather indicated in conditions of insomnia which take their origin in pain. When there is vascular excitement present, it is desirable to combine with it direct depressants of the circulation, as aconite or antimony. The subsequent cerebral anæmia induced by the resort to opium is not so pronounced as is that induced by chloral. *Hydrate of chloral* is comparatively valueless in sleeplessness due to pain, and is inferior, in this respect, it is said, to the croton-chloral hydrate. It is, however, very useful in conditions of vascular excitement, either alone, or in combination with opium. In the delirium of acute pyrexia in children it may be usefully combined with the bromide of potassium. In cases of sleeplessness where there is a sustained high blood pressure, or where there is distinct pyrexia, chloral hydrate is the hypnotic *par excellence.* It is, however, decidedly to be avoided in cases where the inability to sleep is due to worry and to brain exhaustion. The special use of *bromide of potassium* lies in its utility, where cerebral activity is kept up by far away peripheral irritation, especially when that irritation lies in the pelvic viscera. It may be given alone, or with opium, or with chloral, according to circumstances. (Dr. J. Milner Fothergill, p. 72.)

SUNSTROKE.—*Subcutaneous Injection of Quinine,* —If there is anything in the practice of medicine which may be described as *magical,* it is the effect of the subcutaneous injection of quinine in sunstroke. A soldier was completely comatose from sunstroke, with dilated pupils, stertorous breathing, face flushed, skin burning hot, pulse full and rapid. A solution of 5 grains of quinine in 5 minims of dilute sulphuric acid, and 50 minims of water, was put under his skin in different places, about the shoulders. Within one hour, the heat of surface had perceptibly decreased; he steadily improved during the night, was quite sensible next morning, and recovered without any bad symptoms. As far as I am aware, this was the first case in which quinine was *hypodermically* employed. (Surgeon A. R. Hall, p. 88.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

ANTISEPTIC [LIGATURES IN LIGATION OF LARGE VESSELS.—The carbolised catgut ligature may be used with complete success for tying the external iliac artery. This is proved by a case in which the catgut was applied close to aneurismal sac under Poupart's ligament. The wound was treated antiseptically and did admirably. The advantage is the harmlessness of the material left in the wound, enabling us to close it at once. (Mr. O. Pemberton. p. 165).

AORTIC ANEURISM.—*Distal Ligature.*—From my experience in cases of thoracic and cervical aneurism, and from an observation of cases treated by my friend and colleague Dr. G. Balfour, I can testify to the value of iodide of potassium in relieving the symptoms and promoting coagulation in this disease; but I am inclined to express the opinion that, should a fair trial of this drug fail to give complete relief to the symptoms, the distal ligature of the carotid should be employed, provided the case be a suitable one for the operation. The test of the suitability of the case for operation being the effect which temporary pressure on the distal portion of the carotid has on the aneurismal pulsation. If such pressure diminish the aneurismal pulsation, and should there be sufficient space to ligature the common carotid above the tumour, then I think the case is a proper one for operative interference. The case reported further illustrates the value of the antiseptic catgut ligature and other antiseptic precautions, the combined use of which has, in my opinion, removed all the most serious risks in connection with the ligature of arteries. (Mr. T. Annandale, p. 103.)

EPISTAXIS.—In the case of a woman suffering from cardiac disease, in whom epistaxis had been going on some hours, I injected up both nostrils a solution containing one part of liquor ferri perchloridi fortior and three parts of water with a simple glass syringe, with the result of immediately sealing up the nostrils and stopping the hemorrhage. A quantity of blood had escaped through the posterior nares, and this also stopped at once. I used about three ounces of the solution altogether. There was not the slightest return of hemorrhage, and in two days I removed the plug, which was as perfect as one made with lint or aught else. The second case, of a child, was also one of great severity, and all usual remedies had failed. Half an ounce of the solution (1 to 4) immediately checked the bleeding. I think the injection preferable to making a plug with lint soaked in a solution of iron, for two reasons: 1. It is much more easily applied; 2. It is more likely to reach the seat of hemorrhage, and consequently would be more effectual. (Mr. W. Cox, Winchcombe, British Medical Journal, Feb. 5, p. 157.)

HEMORRHAGE.—*How to stop Hemorrhage from a Large Vein Accidentally Wounded.*—During an operation for cancer of the breast, in which it was necessary to remove some scirrhoid glands from the axilla, an aperture was accidentally made in the axillary vein in one side. It was most undesirable to obstruct the main vein of the limb by tying it across like an artery, and to have introduced a pad of lint into the wound, to compress the orifice, would have been very unsatisfactory practice. Prof. Lister therefore put in practice a method he had long contemplated in case of such a circumstance happening. "All flow of blood being temporarily stopped, by pressure on the vein to the distal side, he threaded a fine sewing needle with the finest catgut antiseptically prepared, and passed it through the coats of the vessel at opposite points of the wound, and at a short distance from its edges, and then cutting off the needle, so as to leave two threads in its track, tied one thread round each half of the wound. The purchase thus secured upon the venous texture prevented the ligature from slipping, and the bleeding was permanently arrested." (Prof. Lister, Edin. Med. Jour., Dec., p. 485.)

NÆVUS.—Nævi about the size of a pin's head, and seated on the skin, are not uncommon on the face. They sometimes spread, they are very enduring, and it is therefore well to destroy them while yet small. The best method is to puncture the little spot with a needle previously dipped in strong nitric acid. This is simple, certain, and leaves no visible mark. It may be destroyed with equal certainty by the heated needle, by the galvanic cautery, or by electrolysis; but these measures are inferior in simplicity and are prone to leave a more distinct cicatrix. (Dr. J. Duncan, p. 170.)

Destruction of Nævus by Electrolysis.—We can not only decompose a chemical substance by electrolysis, as is well known, but we can destroy an organic and living tissue with ease and certainty. An ordinary round flat nævus yields to one electrolytic application, while in extensive "port wine marks" half a dozen or more applications may be required. The current should be directed to the tumour by means of fixed rows of gold needles, connected with both poles of ten to fifteen cells of Becker-Muirhead's battery. As soon as the connection has been made, a destruction of the texture of the nævus is seen to commence, the blood-vessels and the skin withering away rapidly under the eyes of the operator. The destruction is more thorough at the positive than at the negative pole, and the worst parts of the nævus should, therefore, always undergo the influence of the former. As a rule, not a drop of blood is lost during the operation; but if, by sudden movements of the child, one of the needles should come out prematurely and a drop of blood should appear, this can be immediately coagulated, and any hemorrhage checked, by applying the positive pole to the puncture. The whole mass of the tumour is then gradually brought under the influence of the current, care being taken not to act too long or too energetically upon any one point, as otherwise a scar might be left. When everything morbid appears to have been destroyed, the action is discontinued, and the surface covered with a piece of goldbeater's skin. (Dr. J. Althaus, p. 158.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

COLD IN THE HEAD.—Being threatened with a cold in the head, sneezing, watering of the eyes, and considering that these symptoms were purely local, I thought it probable they would be relieved by some purely local remedy which would act as an astringent on the mucous membrane. Having some trisnitrate of bismuth at hand, I took repeated pinches of it in the form of snuff, inhaling it strongly, so as to carry it well into the interior of the nostrils. In a short time the tickling in the nostrils and sneezing ceased, and next morning all traces of coryza had completely disappeared. Bismuth alone, therefore, proved quite successful, but it is better in combination with the ingredients in the following formula. Bismuth by itself is rather heavy, and not easily inhaled, and it is, moreover, necessary that it should form a coating on the mucous membrane. It is, therefore, advisable to combine it with pulv. acaciæ, which renders the bulk larger and the powder more easily inhaled, while the secretion of the nostrils causes the formation of an adherent mucilaginous coating, of itself a great sedative of an irritated surface. The sedative effect is greatly strengthened by the addition of a small quantity of hydrochlorate of morphia, which speedily allays the feeling of irritation, and aids in putting a stop to the reflex secretion of tears. The formula which I find on the whole the most suitable combination of the ingredients of the snuff is as follows: Hydrochlorate of morphia, two grains; acacia powder, two drachms; trisnitrate of bismuth, six drachms. As this is neither an errhine nor a sternutatory, but rather the opposite, it may be termed an anti-errhine or anti-sternutatory powder. Of this powder one-quarter to one-half may be taken as snuff in the course of the twenty-four hours. The inhalations ought to be commenced as soon as the symptoms of coryza begin to show themselves, and should be used frequently at first, so as to keep the interior of the nostrils constantly well coated. Each time the nostrils are cleared another pinch should be taken. It may be taken in the ordinary manner from between the thumb and fore-finger, but a much more efficacious and less wasteful method is to use a small gutter of paper, or a "snuff-spoon," placing it just within the nostril and sniffing up forcibly so as to carry it well within. Some of the snuff usually finds its way into the pharynx, and acts as a good topical application there, should there be also pharyngeal catarrh. The powder causes scarcely any perceptible sensation. A slight smarting may occur if the mucous membrane is much irritated and inflamed, but it rapidly disappears. After a few sniffs of the powder, a perceptible amelioration of the symptoms ensues, and in the course of a few hours, the powder being inhaled from time to time, all the symptoms may have entirely disappeared. (Dr. D. Ferrier, p. 104.)

SPASMODIC ASTHMA.—*Subcutaneous Injection of Morphia.*—An attack of spasmodic asthma may generally be relieved by a dose of morphia administered hypodermically. (Dr. W. McGregor Burns, Practitioner, Feb., p. 136.)

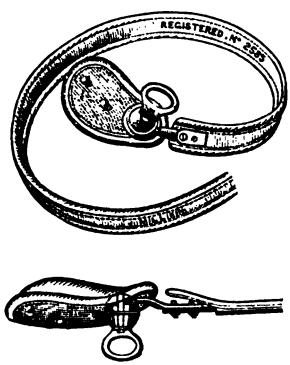
Subcutaneous Injection of Morphia and Atrophia Combined.—In a case of unusually severe midnight paroxysm of asthma, I injected a third of a grain of acetate of morphia; in about ten minutes the breathing was calm and nearly free from wheezing. On awaking next morning nausea, vomiting, and headache detracted somewhat from the joy of my patient at having discovered a remedy so effectual and so speedy in its operation. After repeating the injection with the same results, I combined with the morphia $\frac{1}{100}$ gr. of sulphate of atropia. Within a shorter period—not exceeding five minutes—the breathing was comfortable and free from wheezing, and next morning nausea, vomiting, &c., were not complained of. On one or two occasions I used atropia alone; the result being relief to the breathing in about ten minutes. It was quite clear the relief was much less decided than after morphia alone, and this was inferior to the combination of both remedies, which set the patient's breathing perfectly at ease for the night without the penalty of vomiting and headache in the morning. (Dr. G. Oliver, p. 102.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

ALCOHOLIC DYSPEPSIA.—There are cases, commonly called cases of debility, in which there is no objective sign of organic disease. The leading symptoms are those of persistent dyspepsia; flatulency; irregular action of the bowels; hemorrhoids; much exhaustion under moderate physical exertion, and great mental depression under slight mental disturbances; extreme nervous excitability, amounting to hysterical excitement; a condition of urine variable in character, the fluid sometimes of straw colour, and abundant, at other times scanty and loaded with lithates; the sleep disturbed, with frequent movements and muscular starts of the lower limbs at the moment of going to sleep; a deficient appetite, and a white loaded tongue. In these examples—as common, by the way, to-day as in former times—the old practice used to consist in trying "to regulate" the wine or other alcoholic beverage. My experience now is that these symptoms are in nearly every instance caused by alcohol, and that the only certain successful treatment is total abstinence. (Dr. B. W. Richardson, p. 330.)

HEMORRHOIDS AND PROLAPSUS ANI.—*Injection of Liquor Bismuthi.*—A woman had prolapsus of the bowel to such an extent as to make it evident that at least half a yard of bowel was extruded. External support failed, and astringents had proved of no use. The patient was directed to mix a dessert-spoonful of liquor bismuthi with half a wineglassful of starch, and, after getting into bed and returning the bowel to its place, to introduce this enema and retain it. This treatment succeeded admirably—resulting in a complete cure. It was suggested by its known soothing influence in stomach affections attended with an irritable and congested mucous membrane. In severe hemorrhoids there are usually three parts affected, the integument, the mucous membrane, and the hemorrhoidal veins. Plainly the veins cannot be reached by local medicaments, and those comparatively few cases in which they alone are involved must be treated in other ways. The integument, together with the edge of the mucous membrane up to the grasp of the sphincter, is within easy reach, and may be treated in various ways according to circumstances. Thus, when the congestion is superficial and produces a catarrhal oozing, bathing with whisky or other alcoholic lotion, a small pad of dry cotton-wool firmly applied to soak up the moisture, and also zinc or bismuth in powder or ointment are all exceedingly useful; and when a congested surface within easy reach is accompanied with venous engorgement, tincture of iodine sometimes produces surprising effects, although in other instances it is too painful to be borne. But when the mucous membrane is considerably involved, I know no application to compare with injection of liquor bismuthi, which has the advantage of being painless. (Dr. J. Cleland, p. 181.)

HERNIA.—*Improved Truss.*—Medical men are often troubled by patients with regard to their trusses, which they cannot fit so as to keep up the hernia. Upon examination it is frequently found that the pad simply requires to be turned a little to the right or left, or a little upwards or downwards, or inwards, as the case may be. The pad soon works back into its old position, and the hernia passes as before, so that the truss has to be sent back to the instrument-maker with instructions to alter the direction of the pad. Mr. Millikin, of 35, St. Thomas's-street, Borough, S.E., has put before us a truss which seems to overcome many disadvantages. It will be seen from the diagram that the truss consists of the old German pad and spring, betwen which is placed a ball-and-socket joint, which can be fixed in any direction whatever, and also allows of great or little pressure, to be exercised at will. The fixing handle, *c*, folds down upon the truss, so that it does not show through the dress. The pad may be placed in any position. The extra weight and thickness are



inconsiderable. The instrument is well made and is not expensive. (Lancet, Dec. 4, p. 807.)

OBSTINATE CONSTIPATION WITH SYMPTOMS OF OBSTRUCTION.—A dose of morphia may be given hypodermically with great success in cases of obstinate constipation of the bowels, where the stomach rejects every form of purgative, and where enemata utterly fail. After a hypodermic injection over the region of the stomach of fifteen to twenty minims of the ordinary solution of morphia, vomiting will cease, rest will be procured, and very soon the stomach will receive and retain castor oil or any ordinary purgative sufficient to move the bowels freely, and bring about the desired relief. (Dr. W. McGregor Burns, Practitioner, Feb., p. 136.)

STAPHYLORAPHY.—*A Substitute for Sutures.*—The insertion of sutures in this operation is both tedious and difficult. The following little contrivance, which can be obtained from Messrs. Weiss, is intended to facilitate the approximation of the edges of the cleft. "The instrument is simply a safety-pin, or rather needle, used on the same principle as that for fastening children's clothes. It is about three-quarters of an inch long and slightly curved: at its head is a flat silver knob, to which is attached a spiral silver spring; this spring is shorter than the needle, and on stretching it a sheath at its free extremity receives the point of the needle. The edges of the cleft having been pared, the needle is passed in through one and out through the other, giving a good grip to secure apposition, and going nearly or quite through to the back; the silver sheath fastened to the spiral spring is then drawn across and receives the point of the needle, thus retaining the latter in its place. Two, or as many more needles as are required can be applied, and when union is complete, can be withdrawn by pulling the sheath from the point of the needle and taking the latter out in the usual manner. (Dr. E. A. Rawson, p. 177.)

AFFECTIONS OF THE URINARY SYSTEM.

ACUTE ORCHITIS.—There is no plan of treating acute orchitis so satisfactory as puncture of the testicle by a single incision, from half to three-quarters of an inch in depth. It is only in cases of the most acute form of the disease that I recommend this treatment, and in by far the majority of these instances I have found that the relief given to the pain in the testicle itself is very marked, and almost instantaneous; in fact, so much so that the patients who come to the hospital in severe agony are enabled to walk out of the building comparatively free from pain, and in many instances joking about the treatment to which they have been subjected. I have had patients return to me for similar treatment to the other testis, after undergoing the operation on the one at some previous time, and than this there can be no better proof of their estimation of the relief which is produced by the puncture. When questioned by pupils as to the *modus operandi* of the remedy, I have answered that the suden relief from acute pain is due to the circumstance that the unyielding tunica albuginea is freely incised, and that the tension is thus taken off the compressed and swollen testis; in some instances there is more or less serum effused into the cavity of the tunica vaginalis, and the withdrawal of this greatly assists in giving relief, but in many instances there is hardly any effusion of serum. (Mr. Henry Smith, p. 205.)

In a case of this nature, the testicle was not greatly swollen, but it was very hard; and the scrotum, which was thin, was unusually ruddy. I punctured the testicle, at two or three points on its anterior and outer aspect, with a bistoury one-tenth of an inch wide, to the depth of about four-tenths of an inch. The pain almost immediately began to subside, and convalescence commenced. I punctured the testicle, acting on the same principle that I should perform iridectomy in acute glaucoma. (Mr. T. W. Nunn, p. 206.)

ALBUMEN.—*Examination of the Urine for.*—It is a well-known fact, mentioned in most text-books, that with a small quantity of nitric acid, as with other acids both mineral and vegetable, albumen forms a compound which is not coagulable by heat, but readily coagulable by an excess of nitric acid. (Dr. George Johnson, British Med. Journal, Feb. 26, p. 256.)

The safest test for albumen is, I believe, in all cases the moderate addition of strong nitric acid in such a way as to form a distinct layer at the bottom of the test-tube. If it be added in very large amount, and uniformly distributed, resolution takes place; and, if added in a very dilute state and in small proportion, no coagulation occurs even when afterwards heated. A further addition of acid will, however, still throw down the albumen. (Dr. Charles A. Rayne, Pendlebury, Manchester. British Med. Journal, Feb. 26, 1876, p. 256.)

As the question of albumen or no albumen in urine appears to some a matter of doubtful definition, allow me to suggest the following practical points for observation. They are essentially practical; and let me add that, as clinical observers, our object should be not to problematise simplicity, which is often done, but rather read Nature as she is—simple, benevolent, and to the letter true. 1. Given a test-tube of perfectly clear urine, it matters not whether it be acid or alkaline, the application of cold nitric acid carefully introduced into the tube (that is, by tilting the tube and allowing the acid to trickle gently down the side) will infallibly produce a cloudiness if albumen be present; this might be over the surface of the acid, at the bottom of the tube, or, at the expiration of twenty seconds, at the upper third of the tube. 2. Given a turbid urine of lithiasis, there is no more difficulty (if it be remembered that albumen separates at 170 degrees—that is, 42 degrees below boiling point). Let this urine be placed in a test-tube, and held over a spirit-lamp; the urates will dissolve as soon as the urine becomes warm; then, as it reaches 170 degrees, the albumen will be seen to separate at the upper third of the tube. Then with this be satisfied, and do not boil the urine; for if this be done, and the albumen be in small quantity, it will be re-dissolved. In order to test the accuracy of the experiment, filter away the urates, and test with cold nitric acid as before. 3. Given a semi-turbid, pellucid, pale urine, which one knows by experience to be phosphatic; and here, if the amount of albumen be slight, a little difficulty may be experienced; and the best mode of procedure, if accuracy be required, is to filter away the insoluble material, and to very carefully add cold nitric acid as before. It is a most unsatisfactory mode of procedure to boil the urine and at once to add the nitric acid; for by this oxidising process, new compounds are undoubtedly formed, and the albumen will be either re-dissolved, or, perhaps, chemically changed. Let me say that, if nitric acid be added to a cold clear solution of phosphatic urine, and it gradually become homogeneously pellucid, this is not due to albumen, but to saline matter. (Mr. Thos. S. Dowse, British Med. Journal, March 4, p. 286.)

ANÆSTHETICS IN OPERATIONS ON THE BLADDER.—I have never been very well disposed towards the employment of chloroform for any purpose when it could be dispensed with, but I have of late, mainly owing to the improved methods of producing anæsthesia, availed myself of it much more than formerly. I refer to the system which Mr. Clover always pursues, of administering first nitrous oxide for about thirty seconds, and then following with ether vapour. The rapidity and greater safety of the process as compared with that by chloroform, together with the freedom from subsequent sickness usually attained (the latter an advantage of no slight value), have influenced my practice, and I now make anæsthesia the rule and not the exception. (Sir H. Thompson, p. 198.)

CHRONIC CYSTITIS FOLLOWING LITHOTRITY.—I have only learned during the last few years how extremely small a quantity of urine habitually left behind in an elderly patient's bladder after each act of micturition, provided that he is undergoing, or has just undergone, lithotrity, suffices to *lead to* phosphatic deposit and to chronic cystitis. You will scarcely be*lieve me* that one drachm, or one drachm and a half only of this residual

urine is enough in most such cases to produce the condition so feared and detested by every lithotritist; and I now add, that if the condition is detected early, and this small quantity is promptly and frequently removed by the patient himself, which he can easily do with a soft *coudée* catheter, almost certainly the dreaded symptoms will not appear. For the purpose of washing out the bladder I advise the patient (who may or may not be habitually using the catheter, to empty his bladder) to use every second or third day the following apparatus:—(1) A black flexible catheter, No. 11 or No. 12 in size, made thin, and with polished interior, so as to facilitate the passage of débris through it (a great improvement on the ordinary French flexible catheters, which are thick and have often rough interiors), and having a large oval eye on the upper surface of its extremity, which is slightly turned upwards (*coudeé*). (2) An eight-ounce india-rubber bottle, with a brass nozzle which fits *over* the outer end of the catheter, and not into it. The manifest result of this mode of attachment is, that a powerful uninterrupted current can enter and issue from the bladder ; indeed it is scarcely possible that débris should remain in the organ under the influence of the action of this apparatus, as any one can perceive on using it. It may also be used, as an aspirator, with a backward and forward current, if desired. For the patient's own use it is even more easy than the ordinary four-ounce bottle, which I have long been in the habit of desiring such to apply, since the size and freedom of the channel—not narrowed at the point of contact between bottle and catheter—permit the fluid to be propelled with very slight pressure. An admirable method of treatment is the injection of a weak solution of nitrate of silver every day or every other day, for a short time only. Half a grain to four or six ounces of distilled water is strong enough. This injection is especially useful where there is a tendency to the formation of phosphatic calculus and chronic cystitis. (Sir H. Thompson, p. 199.)

Hydrocele.—In boys and men there are occasionally encysted hydroceles of the testis, or the cord, which continue to increase in size, or in which treatment is urgently requested. In such cases, except in early infancy, acupuncture or the use of a fine trocar often fails to cure. The walls of the cysts are usually thin, and collapse so much when their contents are withdrawn that the injection of a fluid is uncertain. The end of a canula may be outside the cyst, and the iodine solution be consequently injected into the connective tissue at its exterior. In such cases the following is a reliable method of treatment:—The cyst being well isolated, made tense, and brought near the surface, I pass through its centre a stout needle, armed with silk, and leave the threads hanging. The fluid quickly oozes away, especially if a little traction be made on the threads. I then, at one opening, wet the threads with iodine liniment (liniment because the quantity required is so limited) and draw the threads so as to leave moistened portions within the cyst. A little gentle friction will help to spread the iodine thoroughly over the lining membrane of the cavity. An hour later freshly moistened portions may again be drawn through if the cyst be large, or if other methods of treatment have failed. On the other hand, in a very small cyst a single thread, moistened and kept in one hour, will suffice. (Mr. F. Jordan, p. 259.)

Injections.—*To pass an Injection into the Urethra.*—For the purpose of passing an injection into the urethra you may be certain that a syringe containing one fluid drachm is amply sufficient, and that it will distend the urethra for three and a half or four inches. A half-drachm syringe often suffices. It is scarcely necessary to say that these small instruments are much more easily managed by a patient than larger and longer ones. But most patients, unless specially taught to use the syringe, never introduce any injection at all. Unless the orifice of the urethra is carefully closed at the time, the fluid simply leaves the end of the syringe and flows out by the external meatus; and in every case after the injection has been made, the moment the orifice is unclosed the fluid is rapidly expelled by the contractile force of the urethra, and no appreciable quantity remains within. (Sir H. Thompson, p. 184.)

OBSTINATE PERINEAL FISTULA.—*Puncture of the Bladder per Rectum.*—Obstinate perineal fistula not depending upon obstruction of the urethra is best treated by puncture of the bladder per rectum, and leaving there an elastic tube. By this means no urine enters the fistula, and either spontaneously or assisted by art it heals. The following is a new method of operating:—First introduce the staff into the bladder; turn the tip of the staff towards the base of the bladder and rectum; feel for the point with the finger in the rectum, and carefully cut the recto-vesical tissues until you can pass the staff out at the anus. Next unscrew the handle and affix the stem of one of Napier's retentive catheters to the thin end of the staff; soap well the india-rubber; then, holding the silver tube firmly in one hand, draw the catheter (excepting its bell-shaped end) completely into the silver tube by withdrawing the staff at the anus. Lastly, draw back the silver tube and catheter through the urethra into the bladder; push in the catheter, and free the silver tube by also withdrawing it through the rectum out at the anus. The campanulate end of the catheter unfolds itself in the bladder, and its stem loosely hangs at the anus. (Mr. Richard Davy, p. 203.)

SCARLATINAL ALBUMINURIA.—*Gallic Acid.*—Give a teaspoonful of a saturated solution of gallic acid every two hours. It acts very decidedly in curing scarlatinal albuminuria, probably by a direct astringent effect upon the capillaries of the inflamed part. (Dr. J. T. Jamieson, p. 114.)

STRICTURE OF THE URETHRA.—*Physical Examination of the Urethra in Cases of Stricture.*—When a young man consults you for certain troubles relative to which you desire to learn whether urethral obstruction be a cause or not, do not be tempted for an instant to adopt so unnecessary a course (to say the least) as the introduction of very large instruments, or instruments with huge bulbs at the end of them. But simply take a flexible English gum-elastic bougie, well curved towards the point, with a blunt end (since a tapering point, of course, will not mark distinctly the site of stricture), not larger, as a rule, than No. 10 or 11 of our scale, and pass it very gently and slowly into the bladder. If it goes easily—above all, if it is withdrawn without being held, and slides out with perfect facility, take my word for it he has no stricture, and, *quoad* obstruction, wants no use of instruments whatever. In the case of an older man with confirmed stricture, the diagnosis is to be conducted with more attention to detail. I proceed as follows, making what may be called a "survey" of the passage. I commence by passing the soft, blunt-ended English gum-elastic bougie as far as it will go; and when this stops, as it may do within an inch or less of the orifice, I make a note of the distance, and next find what will pass with tolerable ease through the obstruction met with. Very likely a No. 4 or 5 (similar instrument to the preceding) will do so, and it may be then carried further to seek another check, which is not unfrequently met with at about five inches from the orifice. Through this, after a trial or two, a very small gum catheter—say No. 1 or 2—may probably be passed into the bladder, drawing off some urine, and so assuring you of its position. I know then the patient has, at all events, a narrowing near the orifice and another at the distance named. I may verify this at once with a bulbous instrument if I choose; but as long as the anterior narrowing exists, it is as well to postpone more minute research until it is divided, as considerable narrowing at that part always requires to be. Such a one, indeed, is never advantageously treated by dilatation. This being done, the No. 11 blunt-ended bougie is passed, and we learn whether any contraction exists in the interval existing between it and the spot originally marked at five inches. If there is one, the stopping of the bougie will indicate its situation. But if the bougie passes easily to the point just named, the canal is sufficiently open, and we have arrived at what, in ninety-nine cases out of a hundred, is the only remaining stricture; for it is rare indeed, where a narrow stricture exists at that distance from the meatus, that any other will be found beyond. This has next to be dealt with, and, as we are speaking now of old and confirmed cases, there is little doubt that the best treatment will be internal urethrotomy. A word or two about the bulbous exploring

instrument. It should, in my opinion, be of polished metal mounted on a slender metal rod or shaft. No other material slides so easily and smoothly through the urethra. (Sir H. Thompson, p. 186.)

Treatment of Difficult Cases of Stricture by Instruments.—First see the patient pass water in order that you may be certain that he actually has a stricture. Sometimes the difficulty which there may be in passing an instrument does not depend upon a tight stricture, but upon a false passage already made. In this case the stream would be pretty full. Estimate the size of the instruments you will require to use by the size of the stream of urine. If the urine only comes guttatim, after having ascertained the situation of the stricture, introduce the smallest English gum catheter without a stylet, and try to insinuate it through the stricture. For this purpose Messrs. Weiss have produced some exceedingly delicate instruments much smaller than No. 1, and containing a slender steel thread. If such an instrument can be passed, tie it in at once and leave it. You know that it is in the bladder because it is capable of transmitting urine in drops. This is far safer than a fine silver catheter—but this may be tried if the other fail—but it should only be tried by a hand well accustomed to use the catheter, otherwise a false passage is almost certain to be the result. The stricture may be more or less tortuous, in which case the instrument may be applied by what may be called "groping," until by chance it has entered into the stricture, as you may feel by the point being held or grasped by it. Another plan is to examine the part systematically. We will suppose the urethra to require examination on four sides—a roof, a floor, a right side, and a left side. You are to take your slender silver catheter and slide its point delicately along each side successively from the orifice to the place of obstruction. If the orifice of the stricture is not *exactly* in the middle line, and we may fairly believe that it rarely is so, then there is one side of the passage which will more easily lead into the narrow way than any other. If I go down on this side I shall probably not get into the stricture; but if I slide down gradually on the other I shall probably get the instrument in, because you see there is less obstruction on that side. Begin, then, by the roof. The roof is the firmest part, the least likely to furnish obstruction in the way of ducts or lacunæ, and by following it you will be most likely to carry the point in. The floor, on the contrary, is the softest, loosest, and most spongy part, and will be most likely to yield to the instrument and give way. If your first effort does not succeed, take the right side; if that does not do, take the left; if that fails, try the floor. If you are very careful you may make the attempt in this manner for thirty or forty minutes without doing any damage; but if the patient suffers, or if he bleeds, or if you are losing patience, give up the task, or you may make a false passage, and increase the difficulty considerably. (Sir H. Thompson, p. 189.)

Management where there is a False Passage.—A false passage is nearly always on the floor of the urethra, because the mucous membrane is there looser, more yielding, and less supported externally, and it also contains more lacunæ. If you have passed an instrument into a false passage you may know at once by passing your finger into the rectum, when if so, there are only the coats of the bowel between your finger and the instrument, so that you feel it very distinctly. What you are to do, then, is to withdraw the catheter two inches or so, pass it on again, keeping as close along the upper part of the urethra as you can, ascertaining by means of the finger in the bowel that the instrument is not passing into the old route. But when a false passage exists, it sometimes constitutes the chief obstacle to the introduction of an instrument, for, as I have before hinted, the stricture itself may be only inconsiderable. The size of the stream will help to determine this point; and if, so far from being a mere thread, it has a volume equal to a No. 6 or 7 catheter, use a No. 5 silver one, so that you can guide it, and try each side of the urethra successively until you discover which it is that enables you to clear the orifice of the false passage. Remember the result, and you have a key to the difficulty which will

enable you to overcome it with ease on the next occasion. (Sir H. Thompson, p. 193.)

Internal Urethrotomy.—It is a question of no mean importance which arises from the comparison of incision made by machinery and incision made by the intelligent hand. That is the real question in urethrotomy. And the instrument, which I always use, and have operated with so many times, is the type of the method which affords the opportunity of making the incision according to the operator's will and judgment. It is nothing more than a little knife with a long handle, and is used precisely as we use a scalpel anywhere else. Just as we should use a small knife in tenotomy without the sense of vision, where it is not necessary, but guided by the sense of touch, so do I advise you to cut in urethrotomy. I carry the parallel one step further, and remind you, that just as it is essential in tenotomy to divide completely the tendon, and also any little minor band of constricting tissue which opposes the perfectly free play of the joint, so is it essential to make the same complete division also in urethrotomy. The ultimate success in either operation depends on attention to these particulars. The instrument to which I have been referring is the urethrotome of Civiale, made much smaller, as I prefer it to be, than is customary in Paris. The shaft of mine is about the size of No. 3 English scale, with an oblong bulb at the end not larger than No. 5 or No. 6. Within this is a little blade, which, by a clever contrivance, the operator can make to issue at will, as much or as little as he desires, and which he can also sheath instantly at his pleasure. The bulbous end gives him the power of exploring the urethra at the time of the operation, and of determining precisely where and what he ought to divide. The bulb is to be introduced, say fully half or three-quarters of an inch beyond the maximum point of narrowing felt, the blade is then to be projected there, and drawn steadily through the whole of the constricted portion outwards towards the meatus, in which direction the incision is sure to be certain and complete. (Sir H. Thompson, p. 193.)

A Point in the Treatment of Stricture.—In a large number of tight—perhaps very tight—old and neglected strictures, with no great irritability or resiliency or attendant induration, the surgeon is glad to get in a fine instrument and leave it in. Although it may require much patience and skill to introduce the finest bougie, the general custom is to withdraw it and attempt the introduction of a catheter. The effort occasionally fails, and much valuable time is lost. Now, in such cases I have for several years *kept in the fine or filiform bougie, and directed that the urine should be passed from time to time by its side or around it.* In every instance in a large number of cases this has been easily done, micturition, as a rule, actually being easier and in a larger stream than when the bougie is out. In twenty-four hours a goodly-sized bougie (not catheter) can be introduced. On the third day I usually put in a No. 12 or even a No. 13 bougie or catheter. It is of course in the earliest stages that the superiority of the bougie over the catheter is seen. (Mr. F. Jordan, p. 201.).

Urethral Disease from Inflammation of the Epididymis.—Urethral disease following and resulting from inflammation of the epididymis is certainly rare, but when it does occur, is not recognised. Primary inflammation of the epididymis resulting from injury may be followed by urethritis with a creamy discharge, generally whiter than gonorrhœal discharge, but very likely, indeed almost certain, to be mistaken for it. Epididymitis may be a secondary affection to inflammation of the prostatic urethra, which, in its turn, may have been originated by extension of inflammation from the bladder. Many an obscure case of gleet can be explained in this manner. (Mr. Furneaux Jordan, p. 213.)

AFFECTIONS OF THE BONES, JOINTS, &c.

ANTISEPTIC LIGATURES.—*Preparation of Catgut for.*—I described the mode of preparation in the Lancet (April 3, 1869), as steeping the catgut in a mixture of carbolic acid and oil. It so happened that the carbolic acid which I used was liquid carbolic acid, so called—that is to say, crystallized carbolic acid, liquefied by the addition of water. Now, this water makes all the difference in the world. When oil is added to this liquid carbolic acid, a considerable portion of the water is deposited in the form of very fine particles, which are suspended in the oil; and it is this mixture—this emulsion, if we may so call it—of oil and water which causes the remarkable physical change in the animal tissue of which catgut is composed, that alone renders it fit for our objects. The tissue of the catgut in the ordinary condition is utterly unfit for surgical purposes; as slippery, when moistened, as a piece of intestine in the dead-house—when you tie it in a knot, it slips with the utmost ease. But after it has been steeping in the emulsion of carbolic acid, water, and oil, for a certain length of time, it undergoes a physical change, which I am quite at a loss to explain. As the tissue lies steeping in this mixture, the first effect is to moisten it somewhat; then, as time passes, after about a week, you find that, instead of becoming softer, more swollen and more opaque, as you would expect, it is, on the contrary, growing less opaque and beginning to shrink; and in about three months, though still softer than dry catgut, it is comparatively firm, and quite transparent. Now, if you take a fresh piece of dry catgut and put it into this same sample of the preparing liquid, you will find the second piece become in the first instance partially moistened like the first; a fact which renders it inexplicable to me, why the former piece should have undergone what looks like a partial drying. But whatever the explanation, the all-important fact is this, that after the catgut has been thus partially dried, so to speak, in this moist liquid, it is now no longer liable to be made slippery by being steeped in water or the animal juices at the temperature of the body: it is indeed rendered softer and somewhat opalescent, but a reef-knot tied upon it holds better than one on waxed silk. (Prof. Lister, p. 123.)

AMPUTATIONS AND MAJOR-AMPUTATIONS.—*Carbolised Catgut as a Ligature in.*—Carbolised catgut of sufficient strength forms a perfectly efficient ligature for arteries of the largest class, such as the femoral. Some care and judgment perhaps is required in applying it. It is found rather to prevent the occurrence of secondary hemorrhage, for out of over 60 major operations (including 22 amputations of the thigh and two excisions of the hip) secondary hemorrhage occurred only once, and this was not from failure of the ligature. The prepared catgut is sold in hanks steeped in the carbolised oil. It should always be kept in the liquid in stoppered bottles, and only taken out when required, for if this be not done, it is apt to become rough and brittle. When about to be used—as, for instance, in amputation of the thigh—an assistant should cut a piece of about four inches in length for the ligature of the main vessel from No. 4. The remaining arteries should be tied with No. 3. I find that about eight inches of the gut is enough to secure four vessels. The catgut should not be too old, for I have observed that some that I kept in stock for about two years became far more brittle than when more recently prepared. In tying vessels in an open wound I am very particular in separating the artery from its sheath and accompanying veins before proceeding to apply the ligature, and care should be taken to avoid all jerking in tightening the catgut. When the material is sound, it will bear steady pressure without breaking. I venture to claim the following advantages for the catgut—(1) immediate closure of the deeper parts of a wound; (2) absence of sinuous tracts; (3) diminution of subsequent bleeding, or rather its entire absence in consequence of the free use of ligatures to bleeding points during the operation; (4) absence of danger from accidental traction on a ligature; (5) above all, the almost entire avoidance of risk from secondary hemorrhage as illus-

trated by the results of the cases given above. (Dr. A. W. Nankivell, p. 151.)

Excision of the Ankle.—Excision of the ankle is one of those operations in which the advantages afforded by Esmarch's bandage are most appreciated. Not only is the patient free from hemorrhage, but in consequence of the parts not being covered with blood, we can see clearly what we are doing, and need only take away as much of either of the bones as is absolutely diseased, and if on taking one section of bone caries is still evident, we can take slice after slice of bone away until we get to sound osseous tissue, without having our view of the joint cavity in any way obstructed. The joint having been opened on the outer side and the fibula exposed, I separate the periosteum from it with the raspatory, and then cut off the lower end of that bone with the chain-saw. I prefer the chain-saw because it can readily be passed round the bone, and can be kept close to it, so as not to endanger the peronei tendons, and hence I think it presents greater advantages than Hey's or Butcher's saw. I then divide the internal lateral ligament, keeping close to the bone, so as to avoid the flexor tendons and the posterior tibial artery, push the lower end of the tibia through the fibular opening, denude the periosteum, and cut the articular surface and inner malleolus off with Butcher's saw, and lastly with Hey's saw I remove the upper part of the astragalus. Should that bone be extensively diseased it should be freely gouged, and the carious or necrosed portions cleared out with the osteotrite. (Mr. J. F. West, p. 119.)

Non-Union of Fractures.—There are many ways of treating an ununited fracture, but most involve some surgical proceeding. In a case of ununited fracture of the lower end of the tibia and fibula, as none of the usual methods could be applied in this case with any safety, I decided to try what effect a repeated application of percussion, with a rubber-protected mallet, applied all round the articulation, would have. I accordingly commenced the treatment on the 20th of March, and applied percussion every second or third day for four weeks, desisting only for a few days when the parts became irritable. There was applied no splint or appliance whatever. From the first day of the operation there was a daily increase of consolidation and stiffness of the part, which continued until it resulted in a complete bony union in the space of four weeks; and on the 24th of May the patient was dismissed from the hospital quite cured, and free from this defect, the lower end of the tibia and fibula being considerably enlarged. In two other cases percussion was only once performed. The essential point appears to be the production of some degree of periosteal irritation. Messrs. Khrone and Seseman, of London, supply a very neatly-constructed copper-headed mallet which I designed for these operations. (Mr. H. O. Thomas, p. 133.)

AFFECTIONS OF THE SKIN.

Bronchocele.—Cystic bronchocele yields to a variety of operative procedures, but *Solid Bronchocele* is difficult to deal with, and the ablest surgeons of the present day habitually refuse to interfere in such cases, there being imminent risk to life attached to such operations as were previously practised. These tumours, however, often become dangerous to life by pressure on important neighbouring organs, and electrolysis then steps in as the right thing in the right place. I have of late years combined injections of the tincture or liniment of iodine into the substance of the tumour with the electrolytic applications, as it seemed to me that by such combined treatment time was gained. Iodine, subcutaneously injected, appears to break up the internal structure of the tumour, more especially where this is very old and tough, and aids electrolysis by allowing freer passage of the current through the mass. (Dr. J. Althaus, p. 160.)

CHRONIC ECZEMA.—*Lead* v. *Zinc Ointment.*—Lead is an infinitely more suitable agent in the local treatment of eczema than zinc. Lead, however, has been but little used in this country for the purpose. The agent that has been, and still is, chiefly in vogue for this purpose is zinc. It would not be untrue to assert that for some time past—how far back that time may reach I am unable to say—the two principal prescriptions for skin disease in this country have been zinc ointment and zinc lotion. As to the zinc ointment, it is a tradition that it must be *benzoated* zinc ointment. Lead however is, I am well persuaded, by far a more soothing, and at the same time a much more astringent application than oxide of zinc. I have found that it unquestionably allays the itching, restrains the discharge, and diminishes the hyperæmia of ezcema; in short, it *cures* it far more speedily than zinc does. It is of the best mode of applying this efficient agent in the treatment of chronic eczema that I have now more particularly to speak. As a lotion it fails, and I think it is not difficult to see how this happens. The lotion fails to keep the surface moist; the warmth of the body speedily causes it to evaporate; that is to say, the water passes off as vapour, and the lead is left on the surface of the comparatively dry gummy layer of viscid exudation which is characteristic of eczema. Thus the remedy is precluded very considerably from influencing the skin itself, and is deposited simply on the surface of the scab, however minutely dotted and however thin that scab may be. Lead ointment is far more efficient. It preserves the moisture of the secretion, and so permits of the passage by osmosis of the remedy from the ointment through the secretion to the surface of the skin. Glycerine has proved in my hands far superior either to oil or water as a vehicle for applying remedies in the case of chronic eczema. It has neither, so to speak, the desiccating effect of water nor the macerating effect of grease. Its viscidity is about parallel with that of the viscid secretion proper to eczema, so that, in smearing it over, it is readily miscible with it, and while it preserves the surface moist, it readily incorporates itself, and more than that, undergoes true admixture or diffusion (osmosis) with the viscid aqueous solution of lymph and albumen which is exuded slowly but continuously from the surface of the diseased skin. Thus it conveys the remedy held in solution by it more freely to the actual surface of the skin itself. The first effect of the application, even in cases where, both as regards quality and strength, it may be excellently adapted to the condition present, will to the unpractised eye seem an aggravation of the disease—that is to say, the eczematous skin will seem to be redder and more inflamed, as well as moister. The moisture will of course be readily understood, but I find that the redness is very liable to misinterpretation, and so becomes the occasion of a loss of faith in the remedy at the very outset, and even the cause of it being promptly abandoned. It is due simply to greatly increased transparency of the cuticle, and of the thin scabs or scales, consequent on their infiltration with glycerine, which thus enables the inflamed true skin to shine through them somewhat more vividly. The skin, previous to each fresh application of the glycerole, ought to be boldly washed with a soft sponge, well moistened with warm soap-and-water. The remedy is manufactured—or, rather, I should say, the stock which forms the basis from which the remedy is prescribed is made—in precisely the same way as the "plumbi subacetatis liquor" of the British Pharmacopœia, only that glycerine is used in its manufacture instead of water; and to this I have to add that some simple directions as to temperature have also to be followed. It is thus prepared: Take of acetate of lead, 5; litharge, 3½; glycerine, 20. Heat for half an hour in a boiling glycerine bath, constantly stirring, and filter in a gas-oven or other kind of heated compartment. The result is a perfectly clear and colourless liquid of a somewhat more viscid consistency than pure glycerine. Physically, it is a stronger solution than the Pharmacopœia "plumbi subacetatis liquor," inasmuch as the insoluble white residue left by the Pharmacopœial process is nearly double by weight the residue left by the process above directed. Therapeutically, however, the glycerine preparation is a far less active application considered absolutely than the "liquor," besides that it differs

markedly in several essential respects in the *kind* of effect produced by it. It does not appear to be known that equal strengths of solution in water on the one hand, and in glycerine on the other, of any remedy used locally, are very different as to the degree of effect exerted on the skin, the aqueous solution being in every case a far stronger application than the glycerine solution. The reason of this is very obvious: the rapid evaporation of the water under the influence of the heat of the body very soon concentrates the aqueous solution; whereas the comparatively fixed character of glycerine does not allow of any notable evaporation of the solution. (Dr. B. Squire, p. 245.)

Dr. Wathen's method of making the preparation of lead is rather different from Dr. Squire's. It is composed of lard, glycerine, and the subacetate liquor, prepared in the following manner:—Into one ounce of best clarified lard two or three drachms of glycerine is rubbed. After this has been incorporated the addition of the liquor is commenced; the lead is rubbed in until the lard becomes saturated and will not receive any more. In the manner and care with which this is done consists the whole secret of the success of this preparation. If great care be taken to coax and tease the liquor plumbi in, as much as one ounce of the latter can be incorporated with the lard before it becomes saturated. Never has a single case occurred to him of the faintest suspicion of absorption of the lead into the system, although a considerable amount of surface has been enveloped in ointment—for instance, the whole of both legs, from knee down to the foot. This ointment has been found of great service in relieving the suffering in some forms of pruritus, particularly that of the genitals and anus. Herpes preputialis has also given way to this remedy. (Dr. J. H. Wathen, p. 251.)

Lupus.—The tubercular form of lupus may be conveniently treated, as recommended by Hebra, by means of arsenical paste. The formula employed is: Acidi arseniosi, gr. xx; cinnabaris, dr. j.; ungt. rosæ, oz. j. M. The paste should be thinly spread upon linen, which is cut in narrow strips, and accurately applied to the affected part. It is left in position for twenty-four hours, when a fresh application is made without previous washing. If there is deep ulceration nothing will succeed except excision, with subsequent cauterisation with a layer of deliquesced chloride of zinc. (Dr. H. G. Piffard, p. 253.)

Psoriasis.—*India-rubber Underclothing.*—In a case of obstinate or universal psoriasis the effect of retaining the natural moisture of the skin by wearing India-rubber underclothing may be tried. The patient should wash daily all over with warm soap and water. (Dr. B. Squire, p. 258.)

Ringworm.—*Boracic Acid.*—Surgeon-Major Watson reports in the Indian Medical Gazette that he has lately employed boracic acid with very great success as an external application in the treatment of the dermatophyta, or vegetable parasitic diseases of the skin. He was induced to try this remedy from witnessing its employment as an antiseptic in the Edinburgh Infirmary wards. The diseases in which he has hitherto used boracic acid have been the different forms of tinea (T. tonsurans and circinata), and in that very troublesome form of the disease which affects the scrotum and inner side of the upper part of the thighs of many Europeans in India. Dr. Watson declares that the external application of a solution of boracic acid acts like a charm in such cases. An aqueous solution of boracic acid of a drachm to the ounce, or as much as the water will take up at ordinary temperatures, is employed. The affected parts should be well bathed with the solution twice daily, some little friction being used, and it should not be wiped off, but allowed to dry on the part. The remedy is said to be so simple, cheap, and efficacious, that it has only to be once used to be preferred to all other remedies of the same class. (Dr. Watson, Lancet, Nov. 20, p. 750.)

AFFECTIONS OF THE EYE AND EAR.

CATARACT EXTRACTION.—Having decided upon associating an iridectomy with the operation of extraction for cataract, the question arises, shall we do iridectomy now and extract later, or shall we remove the lens and a portion of iris at one and the same time? I should certainly much prefer to make the iridectomy a separate operation, and extract some weeks hence when all trace of the operation, such as haziness of the cornea at the site of the wound, or congestion of the neighbouring tissues, had passed away. The eye is always turned pretty firmly upwards during anæsthesia, and involuntarily, without anæsthetics, by the patient; to turn it downwards with forceps in order to expose the upper segment of the cornea involves the use of a speculum, and is attended with some risk of rupture of the hyaloid membrane, and immediate loss of the eye. The upward tendency of the eyeball, and the downward gravitation of inflammatory products are, on the contrary, rather fortunate incidents if the lower section be adopted; and although I have operated successfully in a large number of cases by the upper section, I think there can be no question that the lens, the capsule, and remnants of cortex are much more easily extruded through an inferior incision. The next question which arises is, what anæsthetic to employ. Nitrous oxide is safe, and scarcely ever causes vomiting, but it occasions struggling, spasm, and a kind of epileptic condition, so that insensibility can seldom be conveniently maintained until the operation is completed: chloroform, bichloride of methylene, and methylene ether are pleasant to inhale, but they all cause vomiting — that from chloroform sometimes lasting for twenty-four hours, while the patient is with each of them exposed to the risk of fatal syncope, or death beginning at the heart. Ether is the only available anæsthetic. (Mr. C. B. Taylor, p. 226.)

EUSTACHIAN TUBE.—*New Method of Making Pervious, and Inflating.*—The method which has of late years been employed with much success for this purpose is that which was first described by A. Politzer. This, as is well known, is as follows: The patient having taken a small quantity of water in his mouth, the end of the nozzle-piece of one of the india-rubber bags, which Leiter (the instrument-maker) has specially constructed for the purpose, is passed about half an inch up the nose; the nostrils are next hermetically closed on the nozzle-piece by means of the thumb and forefinger of the operator's left hand, and then during the swallowing of the water, which the patient has to perform at the command of the operator, the latter, holding the bag in his right hand, suddenly compresses it. Prof. Gruber's method is founded upon the fact that during the pronunciation of the consonant hck, as in hock, strongly accentuating the k, the Eustachian tube is opened. It is better for the purpose to pronounce in order the words *hack*, *heck*, *hick*, *hock*, *huck*. In pronouncing these syllables in this order, we may convince ourselves that the tongue becomes drawn further backwards and more strongly upwards as we proceed with the list of syllables, so that with the syllable huck the tongue is most retracted, and that the upper pharynx is contracted and forcibly shut off. The operator stands, or sits at his convenience, face to face with the patient. The end of the nozzle-piece of a rubber bag, which the operator grasps in his hand, is introduced into the inferior nasal meatus of the patient for about half an inch, and the operator at once hermetically closes the nostrils on the nozzle-piece of the bag with the fore and middle finger of his other hand, and while the patient at the word of command pronounces one of the before-named syllables (*hack*, *heck*, *hick*, *hock*, *huck*, *hck*) the bag is squeezed. Thereupon the air passes with a distinctly perceptible noise through the tube into the cavity of the tympanum. The noise which is produced by the forcible entry of the air through the tube can be auscultated with precision by means of the otoscope. In cases where the membrana-tympani is perforated, the well-known perforation sound is produced. The

patient feels a distinct sensation of the entry of the air into the tympanic cavity. (Prof. Gruber, p. 240.)

ILLUMINATION FOR EYE OPERATIONS.—The following method of illumination is exceedingly useful when operating in eye diseases. The light of an ordinary lamp is passed through a globe bottle filled with water and focused on the spot we wish to light up. In this way we obtain a column of light, about three inches in diameter, of great brilliancy, quite equal to the best daylight, and far superior to the operating-lamps which are generally used for the same purpose, and which, in my experience, are apt to be misdirected by assistants, to explode, and to ignite the vapour of ether when that anæsthetic is used. In fact, the most delicate manipulations may be confidently undertaken at any hour with this simple apparatus, which is at hand in every house. (Dr. C. B. Taylor, Med. Times and Gazette, Feb. 12, p. 181.)

TRANSPLANTATION OF CONJUNCTIVA FROM THE RABBIT.—Symblepharon, or adhesion of the globe of the eye to the lid, has only been cured hitherto by transplantation of conjunctiva from the patient's own eye wherever it can be got. Sometimes, however, there is none to get, or so little as to be of no service. It is found, however, that conjunctival membrane can be successfully transplanted from the cornea of a rabbit. I generally put both the patient and the rabbit under chloroform. I then separate the adhesions so that the eyeball can move in every direction. Next I mark the boundary of the portion of the conjunctiva of the rabbit which I wish to transplant by inserting four black silk ligatures, which I secure with a knot, leaving the needles attached; these black ligatures indicate also the epithelial surface, which would be very difficult to distinguish after separation. I take from the rabbit that portion of the conjunctiva which lines the inner angle, covering the membrana nictitans, and extending as far as the cornea. I select this on account of its vascularity and looseness. The ligatures being put on the stretch, I separate the conjunctiva to be removed with scissors, and I transfer it quickly to replace the conjunctiva palpebræ of the patient, securing it in its place by means of the same needles, and adding other two stitches, or more, if requisite. Both eyes are then covered with a bandage and dry lint. For the first forty-eight hours the conjunctiva has a greyish look, but it gradually loses that appearance, and, with the exception of some isolated patches here and there, it becomes glistening, in some parts looking not unlike conjunctival thickening. These patches gradually decrease until the whole assumes a red appearance. (Dr. J. R. Wolfe, p. 236.)

MIDWIFERY, &c.

ABORTION AND MISCARRIAGE.—*When these occur what is the best way of emptying the Womb?*—1st. The uterus must be compelled to steady action by the administration of ergot, introduced in the form of a strong solution of ergotin in the subcutaneous cellular tissue—a mode of administration of the drug which is destined, I believe, to supersede those with which we have so long been familiar; for the subcutaneous injection of ergotin sets up the uterine contractions with such speed, such certainty, and such safety, that the hypodermic syringe will be found an indispensable part of the furnishing of every obstetric bag. (I use for hypodermic injection a solution of one part of ergotin in three of water, with ten or twelve grains of chloral in each half-ounce bottle of the mixture. Ten drops of this fluid gives the action of the drug with great certainty, and I have seen no ill effects from it.) 2nd. Pending the onset of effective pains, and with the view of at once hastening them and preventing the escape of the blood, we plug the genital canal. For the most part, and as if it were the best in all cases, authors recommended the use of the vaginal tampon. Now, the plugging of the vagina,

by whatever material, is sometimes the only expedient to which we can have recourse, and we may rely on it with much certainty for adverting the immediate danger of excessive hemorrhage. But it seems to me that, where we have our choice, its application ought to be restricted to those cases where there is still some hope that, if we succeed in arresting the hemorrhage, we shall at the same time succeed in averting the impending abortion. Otherwise we have a means of controlling the bleeding more directly, at once less irksome to the patient, and less troublesome of application by the practitioner, in the cervical plug. For this purpose there is nothing so efficient as a good-sized sponge-tent, prepared, as Messrs. Duncan, Flockhart, and Co. now always prepare them, by being dipped in a disinfectant solution before being compressed by the whipcord. In my judgment, nothing can take the place of the sponge-tent for rapid, kindly, and complete dilatation of the cervical canal. (Professor A. R. Simpson, p. 275.)

Induction of Premature Labour.—The old method of puncturing the membranes for the induction of premature labour is to be condemned. Inserting a long gum-elastic catheter between the membranes and the wall of the uterus, and leaving it there, coiling up the end in the vagina, has been found very effectual, but certain objections have been raised to it. It is said that the placenta *may* be partially separated by it, and the membranes *may* be accidentally punctured while pressing it. These should be improbable consequences, and I believe it to be one of the best methods which we have; for, should it fail, it may be followed up by the insertion of sponge-tents. In America, the term "colpeurysis" is used to signify the dilatation of the vagina, and a vulcanised gum-elastic bag called Braun's colpeurynter has been employed to dilate the vagina, with the view of setting up uterine action. While stretching the vagina, it is supposed to act also upon the os uteri, and Dr. Meigs says it is found that about four hours suffice to dilate the os uteri sufficiently to provoke good labour pains. I do not know that it has ever been carried into practice in this country. Dr. Barnes puts in an elastic bougie over-night, which, he says, gives rise to uterine action; next day he introduces his bags. Uterine action has been set up by the bougie, in other words, labour has commenced; why then interfere with a process which, started artificially, may be completed gradually by the efforts of nature? If this argument of carrying out the process of labour "at one sitting, as one would cut for stone," applies in premature labour, why should it not in labour at full term? If not likely to be followed by evil consequences, it would be a great boon to the medical attendant. To be kept about by a patient whom one has found in the first stage of labour is extremely trying. How much time and annoyance would be saved if we could proceed at once "to carry out at the one sitting" the delivery! And I cannot see why it should apply in one case more than in the other. Barnes' bags are of the utmost value when it is desirable to complete the labour in as short a time as possible—for instance, in puerperal convulsions; but in induction of premature labour, for causes not requiring hurry, to my mind their employment partakes too much of an operation, when there is no necessity for such discomfort to the patient. My mode of procedure consists in insinuating, night and morning, between the cervix uteri and the membranes, sponge tents of gradually increasing size; the first, and each succeeding one, being as large as the parts will admit. On removing each tent, and before replacing it by another, a warm douche, containing Condy's fluid, is administered. I have found the use of one, two, and three tents to be sufficient, and have never had occasion to employ more than four. The instrument by means of which the tent is placed in position is made for me by Messrs. Arnold, of West Smithfield. (See Fig. p. 270.) It entirely obviates the use of the speculum, and being provided with what is equivalent to a universal joint, it enables the tent to be pushed, without extraneous guidance, between the cervix and the membranes, taking of itself the readiest path presented to it. For the same reason the membranes run no risk of puncture. The tents themselves are short, rounded at the extremity, and are perforated, to facilitate adaptation to the instrument. The apparatus, and the mode of its application, are so simple, and so free from inconveni-

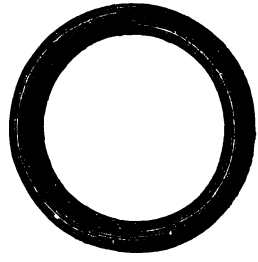
ence and danger, that its use causes in practice little or no anxiety on the part of the patient; and until labour sets in, she moves about without pain or inconvenience, regardless of the presence of the tent. (Dr. Clement Godson, p. 266.)

INEVITABLE LACERATION OF THE VAGINAL ORIFICE, AS DISTINGUISHED FROM LACERATION OF THE PERINEUM.—Anatomically the orifice of the vagina and the obstetrical perineum have no direct connection. They are quite distinct parts, removed from one another by the structures forming the fossa navicularis. It is the orifice of the vagina which I declare to be invariably injured in the natural labour of a primipara. The perineum does not always escape laceration, but it frequently does so. It is not only anatomically that the orifice of the vagina is distinct from the perineum; it ought to be distinguished practically. When the head is on the perineum, or has passed beyond the outlet of the ligamentous pelvis—"out of the bones," as I have heard midwives call it—it is generally described as retained by a rigid perineum. But this description is plainly often inaccurate, for the perineum has yielded as much as can be expected or wished of it, and yet the head is not born. This condition is seen almost exclusively in primiparæ, and it is the orifice of the vagina, not the perineum, that is undilatable or rigid. (Dr. J. Matthews Duncan, p. 294.)

OVARIOTOMY SUPERSEDED.—When the poles of a battery are placed in an albuminous fluid, clothing and thickening take place at the positive pole, and liquefaction at the negative. The same thing happens if an ovarian tumour is subjected to galvano-puncture. Three cases of cure by this plan of treatment are related by Dr. Semeleder. In the first case, the treatment was continued six months, in the second two months, in the third six weeks. In the first case only did the tumour before treatment was commenced reach above the umbilicus. In the second case the remains of the cyst are described as being hard and of the size of a small apple (p. 315).

PENDULUM MOVEMENT IN WORKING THE MIDWIFERY FORCEPS.—The side to side movement of the midwifery forceps in the act of extracting the child's head, or pendulum movement, as it may be called, is not only useless, but mechanically a mistake. The idea that there is any saving of force, so far as pressure on the mother's and child's part is concerned, by resort to the oscillatory or pendulum movement, is such that I cannot argue against it. The question involved is purely mechanical and of extreme simplicity. It is this: a mechanical difficulty in bringing a child's head through a resisting passage has to be overcome; further, the difficulty is not to be evaded by changing the position of the child's head; on the contrary, that position may be supposed to be the most favourable for facility of propulsion. Now, can any oscillation or other imaginable movement diminish the mutual, and, in this case, injurious pressure or force required to produce advance? The question requires no answer. The supposition is absurd. (Dr. J. Matthews Duncan, p. 290.)

PESSARY.—A new form of pessary, and one worth notice, consists of a



watch-spring coiled spirally, with the extremities left free; this is encased in *caoutchouc*, and in its external appearance resembles many of the various

ring pessaries at present known. The advantages of this pessary will appear by reference to the engraving on the left, where it is shown collapsed for facilitating its introduction; when *in situ* it expands to the circular form, as shown on the right of the figure, or assumes such other shape as may best accommodate its contact with surrounding parts. The pessary is made in sets of three, and has the additional merit of being inexpensive. It is made by Salt and Son, Birmingham. (Lancet, Dec. 4, p. 807.)

PUERPERAL FEVER.—Of the several ways in which the subtle poison may be conveyed to the lying-in woman, none is more certainly proved than that it may be conveyed by the hands of the practitioner in making vaginal examinations. But this is not the only way. It may probably be communicated through the clothes, instruments, respiration, or even the secretions of the medical practitioner, midwife, or nurse. That it may be so spread, we have ample evidence, if we look back to the records of Gordon, Armstrong, Gooch, Ramsbotham, and others. Dr. Roberton, of Manchester, gives one of the strongest instances possible. In the space of one calendar month, a midwife attended twenty cases belonging a lying-in charity; of these, sixteen died of puerperal fever. Other midwives of the same charity attended 380 cases in the same district and at the same time, and none of these were affected by the disease. After the birth of the child, a full and perfect contraction of the uterus should be secured, by seeing that the organ is not emptied too suddenly, and that the hand follows the fundus down from above as its contents are expelled. Subsequently to delivery, the various known methods should be practised to promote the contraction of the walls of the womb and the diminution of the uterine cavity; and any clots forming, should be removed from time to time during the hour after removal of the placenta. It is superfluous to say that the placenta should be extracted in its entirety, when possible; and great care should be taken not to leave any detached portions adherent to the uterine walls. The same precautions should be observed, when practicable, in cases of abortion. We are all agreed as to the absolute necessity of preventing, directly or indirectly, any communication between cases of erysipelas and puerperal patients. We are agreed also as to the necessity of the midwifery practitioner avoiding all post-mortem examinations. His hands should avoid all contact with specific poisons or septic materials; and if perchance his fingers have touched anything suspicious, he should at once carefully and thoroughly disinfect them. The necropsies which seem most baneful are of those bodies which have recently died of erysipelas, peritonitis, zymotic disease, or any other inflammatory and febril affections; and in such instances the accoucheur should not even be present in the room when the dissection is made, as, though he decline to touch, yet his person and clothes may become infected by the poison. This care about absolute cleanliness of the hands in attending labours should extend even to occasions when a medical man has had digitally to examine patients suffering from offensive discharges either proceeding from the surface or from the interior of the body. We have heard in this discussion that the discharges from cancer may produce fever in a lying-in woman; and this is probably true of other putrescent discharges. Many chemical substances have been recommended to be added to water for purifying the hands: iodine, chlorine and its compounds, sulphurous acid, cyanide of potassium, carbolic acid, and the permanganates. It matters not which agent is employed, so long as it is used carefully and efficiently; and if it be necessary to disinfect clothing, this is readily done by exposing it in an oven to a high temperature, for which many upholsterers have a suitable arrangement. (Dr. W. O. Priestley. p. 300.)

RAPID DILATATION OF THE URETHRA IN WOMEN.—The great dilatability of the female urethra has been long known, but its rapid dilatation is only of recent date. It can only be undertaken after the administration of anæsthetics. Either the finger or specula, specially designed for this purpose, may be employed after the external orifice has been incised (Simon). The operation is completed in a few seconds; the bleeding that accompanies it is slight and always free from danger. At most it is only sufficient to interfere with the ocular, but never with the digital, examination. The canal may be

enlarged by this means almost to the diameter of an inch without danger. Incontinence of urine is a rare subsequent event. There are a number of cases of so-called cystitis and urethritis and of neurosis, with painful contraction of the bladder, resembling vaginismus, in which forcible dilatation proves the best means of cure. In one case Spiegelberg discovered, by means of rapid dilatation, a polypus in the lower part of the bladder, which had been for years the cause of trouble. (Prof. Spiegelberg, p. 225.)

RUPTURED PERINEUM.—If the parts are brought together immediately after the delivery, the parts exactly fit one another and are so lax that there is no tension on the sutures. The only point for consideration is the selection of the best material to use for sutures, and the best means of introducing the sutures. Soft silver wire is, as I believe, the very best material, on account of its cleanliness, the very slight irritation it causes in the tissues through which it passes, its inelasticity, and the ease with which it is withdrawn. Soft iron wire is only inferior to silver on account of its tendency to become hard and corroded when left for some time in a wound, and thereby giving some pain in its withdrawal. Silk and twine are less suitable as materials for suture, as they cannot be long retained without exciting suppuration. Catgut, whether carbolised or not, is to be rejected altogether for the operation under consideration. If carbolised, it is liable to undergo solution in the secretions of the wound; while ordinary catgut is uncleanly, and irritating to the tissues. Any form of suture-needle may be employed that will carry the suture through the whole depth of the wound, entering the skin a full inch from one margin, and emerging at the same distance from the opposite. Least painful to the patient is some kind of tubular needle, through which the wire may be passed, such as Startin's or Matthieu's needle. Just as efficient, though causing more pain, is the large sickle-shaped needle, fixed in a handle, having an eye at the point. If such an one be used, it should be thrust through the soft parts without the suture, the latter being threaded when the needle-point emerges from the skin, having completely transfixed both sides of the rent: the needle, as it is withdrawn, will leave the suture in position. For very slight ruptures no such formidable instrument is required as the one above mentioned, since the curved needles that are ordinarily carried in a pocket-case will suffice. In operations performed within a few days of delivery, unless the rent lay open the rectum, the sutures may be fastened by simple twisting; and unless they excite irritation, these may remain *in situ* for a fortnight. When the rectum is laid open, it is more prudent to fasten the sutures to leaden plates, buttons, or pieces of bougie, so as to bring the parts together after the manner of quilled sutures, two or three superficial interrupted sutures being also inserted. (Mr. T. Smith, p. 284.)

SHOULDER PRESENTATIONS.—Dr. Maxson, of Syracuse, New York, accidentally discovered that by raising the hips of a woman in labour so as to be relatively much higher than the shoulders, an abnormal presentation was spontaneously rectified. In a difficult shoulder case he acted upon this idea in the following manner: He says, "I folded several quilts compactly, laying them one upon another to the height of about one foot, and assisted her to kneel upon the quilts, with her head and shoulders resting upon the bed, and her face forwards, so as to bring her body to an angle with the bed of nearly 90 degrees. I then pressed my hand gently against the shoulder, which readily receded, until I was enabled to clasp the vertex with my fingers, and with the assistance of the next pain to so "engage" it, that, when the patient was placed upon her left side and the quilts removed, a perfectly natural presentation presented itself. In a few hours the labour terminated in the delivery of a healthy boy, weighing ten pounds. Only a few moments were occupied in the process, and subsequent experience convinces me that *shoulder presentations* can generally be converted in this way into *natural* ones without a resort to 'turning,' and with no risk for the mother or the child." (Dr. P. R. Maxson, Dr. E. Warren, p. 281.)

TUMOURS OF THE MAMMA.—Tumours of the mamma are of two great classes—the malignant and the non-malignant. Simple or non-malignant tumour consists of the collection into one spot of one of the normal constitu-

cnts of the body. Thus, confining our attention to the mamma, we may have fatty tumour, fibrous tumour, adenoid tumour ; and these are simple, because they consist of the same substances which form normal parts of the body. Malignant tumour, on the other hand, is formed of a collection of substances which are a new growth in the human body; of abnormal substances which do not exist in the body of the living man. That is the essence of the distinction between the two kinds of tumour. If you examine the minute structure of the simple non-malignant tumour, you will find it to consist of a modification, it may be of one of the normal tissues of the body; if you examine the malignant tumour, you will find it to consist of tissue of which there is no example in the human body. With regard to the mode of growth, simple tumour extends by increase of bulk, displacing, pushing aside, perhaps causing to be absorbed, the tissues with which it is surrounded. Malignant tumour increases in bulk by incorporating with itself the adjacent tissues, and gradually converting them into itself. Further, simple tumour is for the most part isolated and incapsulated, contained in a membrane which is called its capsule. Real malignant tumour has no absolute defined membrane, but invades all the neighbouring tissue without any well marked margin. The ordinary name of cancer is well given to malignant tumour, because it gradually draws into its centre all the neighbouring parts, so that in the end it extends without limitation. (Dr. G. Buchanan, p. 318.)

MISCELLANEA.

ALCOHOL.—*Its Physiological Action.*—The power of alcohol to lessen oxidation, useless or even injurious in health, increases the value which its other properties give it in the treatment of febrile diseases, where oxidation is going on too quickly, and rapidly destroying the tissues. The very increase of temperature which this oxidation causes, helps of itself to accelerate this disintegration of the tissues, for a high temperature causes them to split up, even although they do not undergo oxidation. Thus the albuminous tissues probably become decomposed and yield urea, other nitrogenous substances, and fat. The fat does not undergo complete combustion but accumulates in the tissues from which it has been formed, and thus the heart of patients who have died of pyrexial diseases, instead of being purely muscular, is generally to a great extent fatty. In such a condition of pyrexia alcohol will diminish the excessive waste in two ways. Firstly, it will impede oxidation, and secondly, by thus lessening the temperature, it will diminish tissue-disintegration. From a survey of all the evidence on this subject, I think we may conclude that in moderate doses alcohol undergoes combustion in the body, and will supply energy, yield warmth, and tend to sustain life in the same way that sugar would do, and is therefore to be reckoned as a food. At the same time it has a power of diminishing oxidation which prevents its employment as a food to any great extent in health, but greatly increases its utility in disease. In feverish conditions it diminishes tissue waste, and thus keeps up strength in three ways :—1. It undergoes combustion itself as a food instead of the tissues. 2. It lessens oxidation in them. 3. It lowers the temperature which itself increases tissue degeneration. If alcohol always quickened the pulse in disease as it generally does in health it would probably be injurious in prolonged illness, as it was found to be in prolonged exertions by the soldiers in Ashanti. But this is not the case, for in fever the quick pulse frequently becomes slower after the administration of alcohol, and, indeed, an excellent rule of practice is not to give alcohol if it increases the rapidity of the pulse already too quick. Alcohol thus economises the vital power of the heart, and tends to prevent death from exhaustion. It is difficult to say precisely how the slowing of the pulse is effected. (Dr. T. Lauder Brunton, p. 335.)

ANÆSTHETICS.—*Administration of Ether.*—I have generally found it best to

give a little chloroform at first. One drachm is usually sufficient. I give a drachm as a dose, poured upon a thickly-folded towel, held about two inches from the patient's mouth. After this quantity of chloroform has been inhaled, ether can be borne, in most cases, without giving rise to any choking. There is rarely more effect from this quantity of chloroform than a little mental obscurity. I then give the ether, in doses of an ounce at a time, poured upon a sponge, fixed at the top of a cap-shaped inhaler, made from an ordinary bedroom towel. The inhaler I use has been devised and described by my friend Mr. Lloyd Owen. It must be applied closely around the nose and mouth; I like it to be large enough to include the nose and the chin. But little air must be admitted. The dose of ether must be renewed about every two minutes, removing the inhaler completely from the face, and allowing one or two inspirations of air, until anæsthesia be induced. When the insensibility is perfect, it may be maintained by giving smaller doses of the ether, half an ounce, at less frequent intervals. We can only judge whether to stop or continue the administration by the condition of the patient. We must give enough ether to produce anæsthesia, and we must continue to give it so as to maintain anæsthesia, so long as the operation may last. But it must never be forgotten that even ether is not absolutely safe when given to full anæsthesia. The administrator must never cease to watch the patient closely, observing, with undistracted attention, the breathing, the pulse, and the colour of the face; he must have nothing whatever to do with the operation or the operator, nor even to look at it or him. (Dr. J. Sawyer, p. 344.)

New Method of Administering Ether Vapour.—There can be no question as to the superiority of ether over chloroform—but it has one drawback, viz., the occasional production of pulmonary inflammation, more of the nature of bronchitis than pneumonia. This may be quite prevented by using the vapour of boiling anhydrous ether, pure and free from any admixture of air. The vapour thus given is quite pleasant, and acts in somewhat smaller quantity and more readily than the vapour at the ordinary temperature. An apparatus for this mode of etherisation has been constructed by Messrs. Salt and Son of Birmingham, and may be obtained from them. (Mr. Lawson Tait, p. 341.)

Chloral as an Antiseptic.—Hydrate of chloral applied in solution externally has powerful antiseptic properties. It has been found as the result of experiment that a lotion containing from 5 to 15 grains of the hydrate of chloral to the ounce of water, formed an excellent dressing to ulcers and wounds, dressed with lint and gutta-percha in the ordinary manner. I use chloral solution as an injection into the sacs of large abscesses, and found that it tended much to diminish secretion and make the parts heal. I found it also a useful lotion for the eye in inflammatory conditions of that organ. It is an excellent application to burns, and very specially where there is a fœtid discharge. I also found it a good application to remove warts from the hands and fingers. I used for this purpose a lotion containing 15 to 20 grains to the ounce of water, applied by means of lint and gutta-percha. It causes no pain, and the wart speedily becomes smaller, and gradually disappears. I also used it as a lotion to sore nipples and to inflamed mucous membranes. (Dr. W. Craig, p. 363.)

Chloride of Lead as a Deodoriser and Disinfectant.—Chloride of lead is the most powerful and economical agent for eliminating sulphide of hydrogen from the atmosphere as well as from all organic matter in a state of decomposition or putridity. To prepare it for use, take, for ordinary purposes, half a drachm of nitrate of lead, dissolve it in a pint or more of boiling water—(nitrate of lead is a soluble salt, and very cheap ; it may be had in any quantity for about a shilling a pound, and should be much cheaper if bought in large quantities),—and dissolve two drachms of common salt (chloride of sodium) in a pail or bucket of water; pour the two solutions together, and allow the sediment to subside. The clear supernatant fluid will be a saturated solution of chloride of lead. A cloth dipped in this solution and hung up in a room will sweeten a fetid atmosphere instantaneously, or the solution thrown down a sink, water-closet, or drain, or over a heap of

dung or other refuse, will produce a like result. Even the tarnishing of gold and silver plate may be prevented by a rag dipped in the solution being hung up in the room or window where it is exposed. It will thus be seen that one great advantage of chloride of lead over all other deodorisers lies in its great cheapness. The cost of the quantity of nitrate of lead required for use may be estimated at a fraction of a farthing; it is easily carried about, or may be sent by post; it is a dry solid, is not caustic, nor will it discolour or blister the skin; it can be kept in paper or a pill box, and therefore does not require a glass or other fragile bottle. (Dr. R. H. Goolden, p. 51.)

Salicylic Acid.—Salycilic acid is three times as powerful in its antifermentative action as carbolic acid. Experience has proved that it is equally reliable as a preventive and corrective of putrefaction when applied to sores and wounds, and that it materially assists reparative action. Salicylic acid is a trustworthy antiseptic. But carbolic acid has been proved beyond doubt to be so also, and boracic acid is largely used for similar purposes; therefore, unless salicylic acid possesses advantages over both, its substitution for either cannot be justified. It does, however, seem to me to possess certain advantages, which, though few in number, are not of less importance on that account; they may, I think, be best elicited by comparing carbolic and boracic acids with it. The two manifest objections to the use of carbolic acid, valuable agent though it be, are its irritating action and its smell. Salicylic acid can hardly be termed an irritant, and preparations containing only a small percentage of it can be thoroughly relied on as trustworthy antiputrescents, and it is odourless. As an application to granulating surfaces a lotion containing 1 part of acid, 3 of sodium phosphate, and 50 of water has been found useful. As already mentioned, heat and the addition of borax increase its solubility; a clear lotion of considerable strength can thus be obtained: for instance, 10 grains of acid can be readily dissolved in one ounce of water by heating and then adding six grains of borax, or even 20 grains of the acid will be taken up by an ounce of water if 14 grains of borax are added. These solutions, in addition to their use as lotions, may be used as gargles, where an antiseptic and astringent gargle is indicated. To a surface where it can be accurately applied, and where the discharge is slight, though I have tried it with excellent effect where it was profuse, the cerate suggested by Prof. Lister for rodent ulcer—salicylic taking the place of boracic acid—is a nice application. The formula is: from half a drachm to a drachm of salicylic acid, one drachm of white wax, two drachms of paraffin, and two drachms of almond oil; melt and rub up in a heated mortar. It should be spread on strips of muslin or fine linen. Another ointment may be made of sperm oil, one drachm and a half; oil of theobroma, five drachms and a half; salicylic acid, from half a drachm to a drachm. This forms a thick paste, which should be thickly spread on lint. A very simple and most useful ointment, and one which answers admirably in some affections of the skin, is formed of half a drachm to a drachm of the acid to seven drachms of simple ointment. Though neither watery nor oily preparations of this acid belong to what is termed elegant pharmacy, yet a liniment of salicylic acid and olive oil will be found of much efficacy in burns. I cannot refrain from urging its use in eczematous affections, for nowhere is its beneficial action more marked than in them. In the eczema of children, more especially in that found affecting the head and face, it is far superior to any remedy I have yet employed. (Dr. J. C. Ogilvie Will, p. 40.)

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" .. .. 1 "
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" " ..... 1 "
" " ..... 1½ "
" " ..... 2 "
" " ..... 3 "
" " ..... 4 "
" " ..... 5 "
Quinine, Bi Sulphate ..... ½ "
" " ..... 1 "
" " ..... 1½ "
" " ..... 2 "
" " ..... 3 "
" " ..... 4 "
" " ..... 5 "
Quinine and Aloes ..... 1 "
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- Pulv., Aloes, Soc., ¾ "

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- Acid, Arsenious, 1-60 "
- Ext., Nucis Vomicæ, ¼ "

Quinine, Phosphorus and Nux Vomica—
- Quiniæ, Sulphas, 1 gr.
- Phosphorus, 1-60 "
- Ext., Nucis Vomicæ, 1-40 "

Quinine, Phosphorus and Nux Vomica—
- Quiniæ, Sulphas, 1 gr.
- Phosphorus, 1-60 "
- Ext., Nucis Vomicæ, ¼ "

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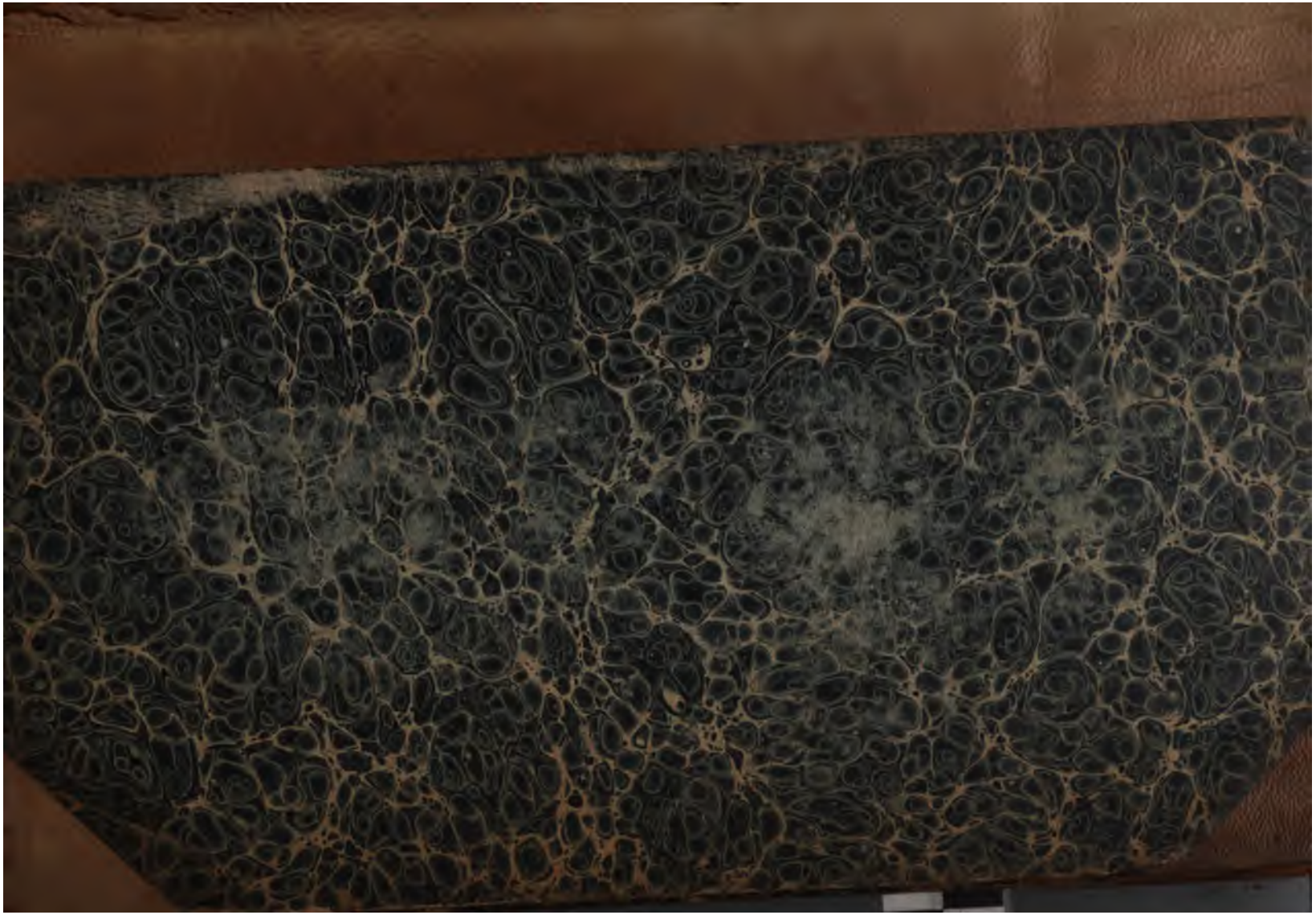
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